C21.5:978/4

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OFFICIAL GAZETTE

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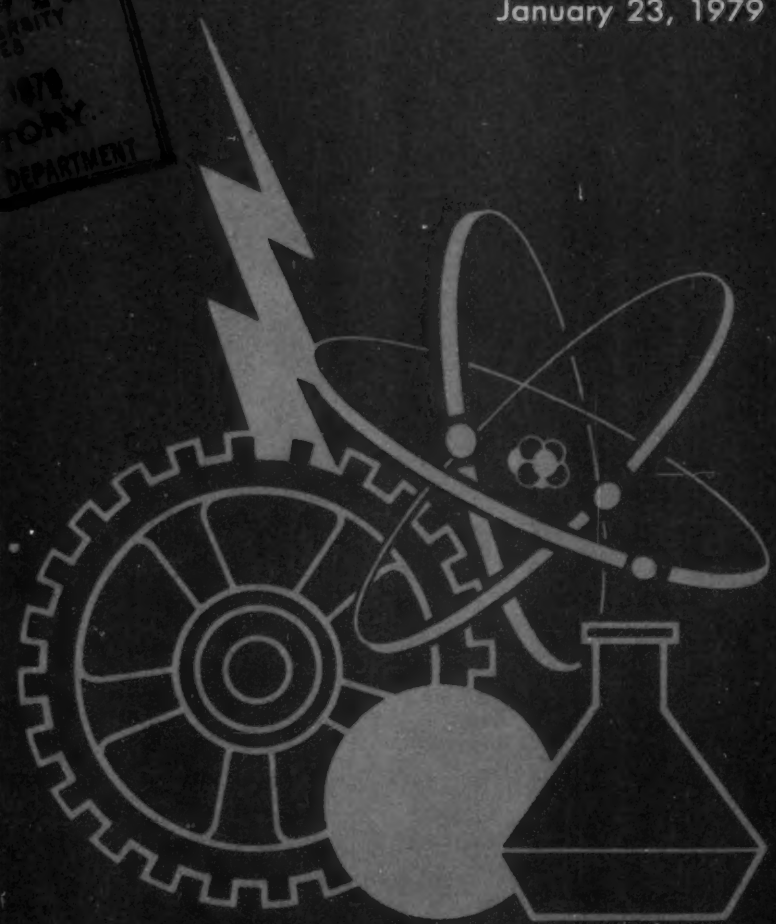
PATENTS

January 23, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

January 23, 1979 Volume 978 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

National Inventors Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 10, from 1 :00 p.m. to 5 :00 p.m. and Sunday, February 11, 1979 from 10 :30 a.m. to 5 :00 p.m. The public is invited to view the exhibits on these days and to attend the dedication of the National Inventors Hall of Fame and the induction of four inventors into the Hall of Fame at 1 :00 p.m. on Sunday, February 11.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5 :00 p.m. on Friday, February 9, 1979.

We would appreciate the cooperation of all users of the Search Room facilities by removing all personal properties and items for the early closing.

LUTRELLE F. PARKER,
For DONALD W. BANNER,
Dec. 7, 1978. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,339,546, Re. S.N. 959,130, Filed Nov. 9, 1978, Cl. 128/156, BANDAGE FOR ADHERING TO MOIST SURFACES, James Ling Chen, Owner of Record: *Olin Mathieson Chemical Corp., New York, N.Y.,* Attorney or Agent: Lawrence S. Levinson, et al., Ex. Gp.: 335

3,458,436, Re. S.N. 960,334, Filed Nov. 13, 1978, Cl. 210/20, PROCESS FOR THE TREATMENT OF LIQUIDS WITH ION EXCHANGERS, Friedrich Martinola, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 176

3,838,831, Re. S.N. 962,870, Filed Nov. 22, 1978, Cl. 242/107.4 R, VEHICLE SENSITIVE RETRACTOR, Lon E. Bell, Owner of Record: *Allied Chemical Corporation, Morris Township, N.J.,* Attorney or Agent: Roger H. Criss, Ex. Gp.: 242

3,845,754, Re. S.N. 961,778, Filed Nov. 17, 1978, Cl. 126/121, FIREPLACE HOME HEATER, Albert L. Wilkening, Owner of Record: *Inventor,* Attorney or Agent: John D. Gould, et al., Ex. Gp.: 345

3,894,682, Re. S.N. 963,891, Filed Nov. 27, 1978, Cl. 310/156, ALTERNATING CURRENT GENERATORS AND MOTORS, Kenneth John Binns, Owner of Record: *National Research Development Corporation, London, England,* Attorney or Agent: Charles R. Donohoe, Ex. Gp.: 212

3,903,961, Re. S.N. 915,585, Filed Oct. 16, 1978, Cl. 165/89, HOT OIL DRUM, Peter Stanislaw, Owner of Record: *Morrison Machine Company, Paterson, N.J.,* Attorney or Agent: Lawrence I. Lerner, et al., Ex. Gp.: 342

3,941,871, Re. S.N. 959,560, Filed Nov. 9, 1978, Cl. 423/326, CRYSTALLINE SILICATES AND METHOD OF PREPARING THE SAME, Francis G. Dwyer, et al., Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Raymond W. Barclay, Ex. Gp.: 113

4,034,791, Re. S.N. 963,558, Filed Nov. 24, 1978, Cl. 152/361, PNEUMATIC TIRE WITH REINFORCING BELT, Henri J. Mirtain, Owner of Record: *Uniroyal, S.A., Clairoix, France,* Attorney or Agent: Phillip Rodman, Ex. Gp.: 316

4,043,923, Re. S.N. 964,063, Filed Nov. 27, 1978, Cl. 252/8.75, TEXTILE TREATMENT COMPOSITION, Basil L. Loudas, Owner of Record: *Minnesota Mining and Manufacturing Company, Saint Paul, Minn.,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 144

4,076,379, Re. S.N. 962,600, Filed Nov. 21, 1978, Cl. 350/96.22, FIBER OPTIC CONNECTOR, Rene Joseph Chouinard, Owner of Record: *United Technologies Corporation, Hartford, Conn.,* Attorney or Agent: Robert C. Walker, Ex. Gp.: 257

PATENT NOTICES

Certificates of Correction for the Week of Jan. 23, 1979

Re. 29,586	4,088,329	4,097,360	4,113,504
Re. 29,696	4,090,425	4,097,391	4,113,532
D. 248,491	4,090,478	4,098,535	4,113,747
D. 249,718	4,090,992	4,098,551	4,114,760
3,819,763	4,091,041	4,098,564	4,115,306
3,914,102	4,091,955	4,098,803	4,115,971
3,950,745	4,092,268	4,098,837	4,116,318
3,983,193	4,092,458	4,098,922	4,116,361
4,020,314	4,093,059	4,099,919	4,116,801
4,023,061	4,093,524	4,100,083	4,117,104
4,026,827	4,093,543	4,101,272	4,117,337
4,028,343	4,093,764	4,101,328	4,117,810
4,048,443	4,093,803	4,102,236	4,119,269
4,050,594	4,094,327	4,102,323	4,119,364
4,052,382	4,094,628	4,102,731	4,119,373
4,063,994	4,095,187	4,103,219	4,120,420
4,075,655	4,095,239	4,103,624	4,120,748
4,079,202	4,096,021	4,103,765	4,120,909
4,081,658	4,096,029	4,104,053	4,121,049
4,084,366	4,096,125	4,105,079	4,122,400
4,085,220	4,096,533	4,105,247	4,122,415
4,086,410	4,096,608	4,105,631	
4,087,540	4,096,756	4,105,965	
4,088,035	4,096,794	4,113,022	

Disclaimers

3,577,850.—*Rano J. Harris, Sr.*, Baton Rouge, La. METHOD OF FORMING SEALS. Patent dated May 11, 1971. Disclaimer filed Feb. 14, 1978, by the inventor.

Hereby enters this disclaimer to claims 1–8 of said patent.

3,618,218.—*Rano J. Harris, Sr.*, Baton Rouge, La. PROCESS FOR MEASUREMENT OF INACCESSIBLE SMALL DIAMETER BORES. Patent dated Nov. 9, 1971. Disclaimer filed Feb. 14, 1978, by the inventor.

Hereby enters this disclaimer to claims 1–11 of said patent.

3,791,560.—*Rano J. Harris, Sr.*, Baton Rouge, La. SEALS (PSC–14). Patent dated Feb. 12, 1974. Disclaimer filed Feb. 14, 1978, by the inventor.

Hereby enters this disclaimer to claims 1–10 of said patent.

3,979,695.—*Heinz Schlotz*, Esslingen-Hegensberg, Germany. SUSPENSION CLAMP FOR ELECTRICAL OVERHEAD LINES. Patent dated Sept. 7, 1976. Disclaimer filed Nov. 17, 1978, by the assignee, *Firma Karl Pfisterer*.

Hereby enters this disclaimer to all claims of said patent.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before March 2, 1979.

Anderson, Charles P., 3285 Paloma, Pasadena, Calif. 91006
Berman, Charles, 930 Euclid St., #201, Santa Monica, Calif. 90403
Camarillo, Raymond G., 854 N. Grandview, Fullerton, Calif. 92632
Cline, Gerald L., 7716 Dunbarton Ave., Los Angeles, Calif. 90045
Farmer, Mary E., 1201 Turquesa Lane, Pacific Palisades, Calif. 90272
Float, Kenneth W., 13229K Fiji Way, Marina del Rey, Calif. 90291
Kalmbaugh, David S., Dept. of the Navy, Naval Weapons Ctr., Code 012, China Lake, Calif. 93555
Lynn, John H., 527 El Prado Dr., Ridgecrest, Calif. 93555
McKenzie, Frank G., 4936 N. Diversey Blvd., Milwaukee, Wis. 53217
Miller, Laird F., 6918 E. Belmont Ave., Paradise Valley, Ariz. 85253
Montanari, Gary L., 42 19th St., Hermosa Beach, Calif. 90254
Nissle, Tod R., 15250 N. 5th Lane, Phoenix, Ariz. 95023
Rodewald, Newell C., P.O. Box 652, Manhattan Beach, Calif. 90266
Ryan, Daniel D. III, P.O. Box 132, Jackson, Wis. 53037
Saari, David S., 520 Alvarado Ave., #706, Davis, Calif. 95616
Shifrin, Gordon A., 7145 Fernhill Dr., Malibu, Calif. 90265

LUTRELLE F. PARKER,
Dec. 26, 1978. *Chairman, Committee on Enrollment.*

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 18, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-19-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-29-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-22-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-1-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-16-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,607,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

REISSUES

JANUARY 23, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,887
BOX OR PACKET FOR CIGARETTES

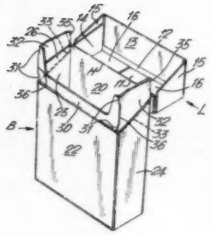
Austin L. Fox, and William A. A. Jones, both of London, England, assignors to Molins Limited, London, England

Original No. 3,874,581, dated Apr. 1, 1975, Ser. No. 372,367, Jun. 21, 1973. Application for reissue Feb. 17, 1977, Ser. No. 769,814

Claims priority, application United Kingdom, Jun. 30, 1972, 30629/72

Int. Cl.[2] B65D *5/66*

U.S. Cl. 229—44 CB 18 Claims



1. A hinged lid packet with a lid portion hinged to a body portion, the body portion comprising a front wall including an integral recessed panel extending upwardly from the front wall, a rear wall, a pair of side walls each formed by an inner flap and by an outer flap, one of said flaps extending from the rear wall and the other of said flaps extending from the front wall, the recessed panel [being narrower than the front wall and] being recessed towards the interior of the packet and disposed substantially parallel to said front wall so that when the packet s closed the panel lies wholly within the lid portion, and a pair of side flaps extending from the sides of the recessed panel in a direction parallel to the respective side walls, the lower part of each side flap being sandwiched between the inner and outer flaps of the respective side walls.

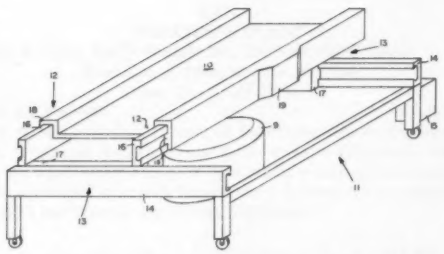
Re. 29,888
SYSTEM FOR WHOLE BODY IMAGING AND COUNT PROFILING WITH A SCINTILLATION CAMERA

Ervin Kaplan, 2600 Wilmette Ave., Wilmette, Ill. 60091

Original No. 3,839,641, dated Oct. 1, 1974, Ser. No. 372,835, Jun. 22, 1973. Application for reissue Sep. 29, 1976, Ser. No. 727,784

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—363 S 32 Claims



1. A system for producing information on the distribution of a source of radiation in an object that can be displayed in image form or in count profile form, said system comprising a scintillation camera having a scintillation detector, a radiation shield and a data processing mechanism; said scintillation camera representing a scintillation event as a first set of coordinates in terms of a first set of signals; means for supporting thereon an object having a source of radiation therein; motor mechanism for providing relative movement of extended linear dimension along [both] *at least one of* the X and Y axes between said scintillation detector and said support means, the extended linear dimension along [both] *the one of* the X and the Y axes being substantially greater than the [dimensions] *dimension* of said scintillation detector in [both] *the one of* the X and the Y direction to enable substantially the entire support means to be scanned *in the one direction* by said scintillation camera; mechanism for indicating relative movement between said support means and said scintillation detector and for producing a signal in response thereto; and electronic interfacing means coupled to said scintillation detector and to said data processing mechanism and to said movement indicating mechanism for converting the signal from said movement indicating mechanism to a second set of coordinates and for summing the first set of coordinates and the second set of coordinates and converting the sum into a second set of signals and for replacing the first set of signals with the second set of signals, continued relative movement between said scintillation detector and said support means with the object resulting in n sets of signals over extended linear [dimensions] *dimension* along [both] *the one of* the X and Y axes summed before display to correct nonuniformity, non-linearity and edge distortion in said scintillation detector, whereby the n sets of signals, received by said data processing mechanism are displayed in image form or in count profile form.

PLANT PATENTS

GRANTED JANUARY 23, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,369

ROSE PLANT

Ernest Schwartz, deceased, late of Kingsville, Md., by Hazel E. Schwartz, executrix, assignor to F. Harmon Saville Nor'East Miniature Roses, Rowley, Mass.

Filed Nov. 25, 1977, Ser. No. 855,015
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by recurrent rose red flowers borne usually in sprays on the plant especially well adapted for pot forcing due to its ability to break readily from the soil and having conspicuously abundant foliage.

4,370

COMPACT PEACH TREE

Peter J. Van Well, Wenatchee, Wash., assignor to Van Well Nursery, Wenatchee, Wash.

Filed Dec. 21, 1977, Ser. No. 862,741
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree characterized as to novelty by its compact, semi-dwarf habit of growth, by the development of more fruit buds than are normally found on trees of the standard Gold Medal variety, and by the more vigorous growth and fruit bearing capabilities of its lateral buds along most of its terminal shoots.

4,371

IMPATIENS PLANT

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Feb. 3, 1978, Ser. No. 875,598
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name Chippewa, that has variegation depending on light intensity and age of cutting; a candy striped light pink flower; many flowers; a very upright growth habit; and a slight foliar reddening.

PATENTS

GRANTED JAN. 23, 1979

ERRATA

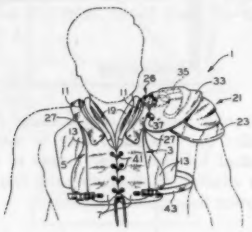
For CLASS	See PATENT NO.
015–244 R	4,135,274
029–026 A	4,135,278
105–131	4,135,453
125–015	4,135,499
182–194	4,135,508
028–221	4,135,511
277–001	4,135,589
425–275	4,135,867
422–072	4,135,883
422–059	4,135,884
422–142	4,135,885
422–216	4,135,886
210–083	4,136,008
210–114	4,136,009
210–164	4,136,010
210–168	4,136,011
210–208	4,136,012
208–251 R	4,136,021
546–258	4,136,033
521–032	4,136,067
252–400 A	4,136,083
528–481	4,136,084
528–189	4,136,085
528–099	4,136,086
528–219	4,136,087
528–309	4,136,089
528–060	4,136,092
546–112	4,136,095
562–503	4,136,109
562–532	4,136,110
562–577	4,136,111
562–518	4,136,112
568–565	4,136,123
568–591	4,136,124
423–321 R	4,136,199
178–068	4,136,258

PATENTS

GRANTED JANUARY 23, 1979

GENERAL AND MECHANICAL

4,135,252
SHOULDER PAD
Roland N. Latina, Belleville, Ill., and Hal D. Mitchell, Rolla, Mo., assignors to A-T-O Inc., Willoughby, Ohio
Filed Jun. 6, 1977, Ser. No. 804,013
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **5 Claims**



1. A shoulder pad for football players comprising a left-hand member adapted to fit over the left shoulder and a right-hand member adapted to fit over the right shoulder, each of said members being a relatively rigid member of generally inverted U-shape as viewed from the side and having a chestplate portion, a backplate portion and an arch integrally connecting said plate portions, said arches being laterally spaced to provide an opening for the neck of the wearer with the spacing such that said arches lie relatively closely adjacent the neck, and said arches being relatively narrow in relation to the width of the shoulders and terminating laterally inwardly of the upraised outer portions of the shoulders when the arms are raised above the head for resting on the shoulders within the spaces between the neck and said upraised outer portions of the shoulders so as to provide freedom for raising the arms above a horizontal position by allowing for upward movement of the outer part of the shoulders without interference from said arches, each of said members having padding on the inside thereof with the padding at the top of the arch of each member generally of the same narrow width as the arch so as to provide said freedom, and a pair of caps of relatively rigid material adapted to fit over the outer part of the shoulders, said caps being flexibly connected to the arches and having shoulder padding on the inside thereof separate from said arch padding so as to enable the caps and padding thereon to move freely upwardly upon said movement of the outer part of the shoulders.

4,135,253
CENTRIFUGAL BLOOD PUMP FOR CARDIAC ASSIST
Sanford Reich, St. Louis Park, and William H. Gates, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Filed Nov. 30, 1976, Ser. No. 746,008
Int. Cl.[2] A61F *1/24*; A61M *1/03*
U.S. Cl. 3—1.7 **17 Claims**

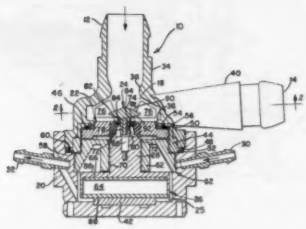
3. A centrifugal blood pump comprising:

a) a cylindrical pump housing having a scroll pump chamber within said housing, a rotor housing connected to said pump housing having a rotor chamber and a baffle plate separating said pump housing from said rotor housing, an axially disposed aperture in said baffle plate, an impeller having a first shank and disposed in said pump housing;

b) a rotor having a second shank and disposed in said rotor housing, said impeller being connected to said rotor by passing said first shank through said axially disposed aperture in said baffle plate and connected to said second shank;

c) a seal surrounding said first shank and affixed in said axially disposed aperture of said baffle plate to prevent blood in said pump chamber from seeping into said rotor chamber;

d) an axially disposed first inlet in said pump housing for bringing blood into said pump chamber;

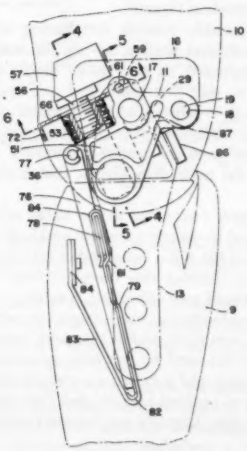


e) a transverse first outlet in said pump housing for removing blood from said pump chamber;

f) a second inlet in said rotor chamber for bringing a saline solution lubricant into said rotor chamber; and

g) a second outlet in said rotor chamber for removing the saline solution lubricant from said rotor chamber.

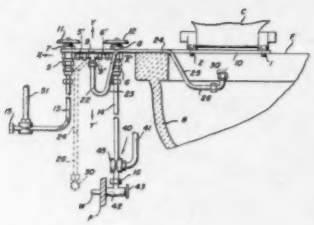
4,135,254
PROSTHETIC KNEE APPARATUS
T. Jerome Weber, Mountain View, and Roy D. Roberts, San Jose, both of Calif., assignors to Hosmer/Dorrance Corporation, Campbell, Calif.
Filed Jun. 13, 1977, Ser. No. 806,159
Int. Cl.[2] A61F *1/04, 1/08*
U.S. Cl. 3—26 **23 Claims**



1. A knee prosthesis, comprising a pair of spaced side support members depending from an upper leg prosthesis, a knee mechanism housing disposed between said side support members, a pair of spaced leg brackets secured at their lower ends to a lower leg prosthesis, an anterior pivot shaft extending laterally through said housing and through said side support members, a posterior pivot shaft extending laterally through said housing and through said leg brackets, and frictional locking means, actuated by pivotal motion about said anterior

pivot shaft, to immobilize said leg brackets with respect to said knee mechanism housing.

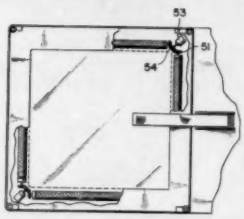
4,135,255
PRE-ASSEMBLED BIDET ATTACHMENT
Jorge Menendez, P.O. Box 420496, Miami, Fla. 33142
Filed May 16, 1977, Ser. No. 797,554
Int. Cl.[2] A47K *3/22, 11/08*
U.S. Cl. 4—7 **4 Claims**



1. A pre-assembled bidet attachment to a toilet bowl, comprising
   a. an integral bar provided with a pair of openings adjacent to one end thereof for mounting on the rear flange of the toilet bowl in conjunction with the toilet seat and cover therefor,
   b. said bar having a pair of openings adjacent to the opposite end thereof for mounting the bidet assembly thereon,
   c. said assembly comprising
   d. a pair of valve units extending through said last-mentioned openings, each terminating in a control handle above said bar and a coupling to a water supply below said bar,
   e. a rigid T-shaped coupling having the opposite inlet ends thereof mounted below said bar between said valve units for rotation around a horizontal axis and an outlet nipple at the mid-portion thereof.
   f. a rigid adjustable conduit terminating in an upwardly directed U-shaped portion having the outer arm thereof rotatably mounted on said outlet nipple around an axis transverse to said first-mentioned axis and its inner arm merging into a substantially horizontal conduit portion adapted to overlie the upper lateral edge of the toilet bowl and another portion bent downwardly and then outwardly in the same direction as said horizontal portion. and
   g. a spray nozzle connected to the outlet of said outer portion, adapted to assume alternate positions at substantially the center of the toilet bowl and at said lateral edge adjacent to the flushing rim thereat solely by the manual manipulation of said adjustable conduit,
   h. said adjustable conduit also adapted to swing around said horizontal axis from within the toilet bowl to a position thereabove followed by a rotary movement around said transverse axis and a return movement around said horizontal axis to position said conduit and nozzle in a downward direction, laterally and behind the toilet bowl.

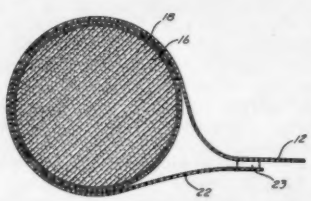
4,135,256
FLOATING SWIMMING POOL
John K. Limegrover, 8112 Aber Rd., Verona, Pa. 15147
Filed Mar. 15, 1977, Ser. No. 777,608
Int. Cl.[2] A47K *3/00*
U.S. Cl. 4—171 **2 Claims**

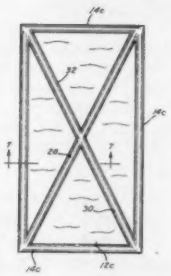
1. A swimming pool unit externally mounted to a floating ship, comprising
   a cage formed of side panels joined to a bottom panel, with said panels formed of a flexible screen material,
   said cage suspended from a rectangular shape open frame fixed externally to the ship,
   together with motorized means to lower the cage into the water to a desired depth of the bottom panel of the cage, in which each side panel of the cage is fastened to an



   individual roller mounted to and under the frame, upon which roller the side panel may be wound, with said rollers linked by mechanical means to said motorized means for winding or unwinding the side panels so as to raise or lower the cage respectively.

4,135,257
FLOATING POOL COVER
Lance G. A. Löf, 1615 17th St., Denver, Colo. 80202
Filed Jul. 11, 1977, Ser. No. 814,498
Int. Cl.[2] E04H *3/19*
U.S. Cl. 4—172.12 **1 Claim**





1. A floating swimming pool cover comprising:
   a. a sheet of generally water impervious, flexible, transparent, plastic shaped to the size and configuration of the surface of the water in the pool;
   b. flotation means secured to the peripheral edge of said sheet, generally completely therearound, and said flotation means comprising a long length of light weight, floatable, foamed, open cell plastic cylinder, and a waterproof plastic sheath encasing and sealed around said cylinder providing a waterproof flotation member; said flotation member having sufficient strength and semi-rigidity and springiness to maintain the sheet over the surface of the water and against the edge of the swimming pool; and,
   c. means at the edge of said sheet, including pocket means

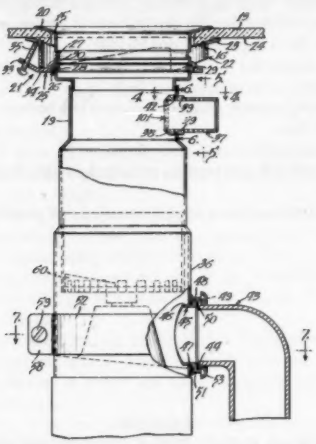
formed by folding back the peripheral edge portion of the sheet and securing the edge to the sheet to form a pocket, securing said flotation means in said pocket at the peripheral edge of said sheet.

4,135,258

WASTE DISPOSER MOUNTING APPARATUS

Albert T. Braga, Stevensville; Robert A. Brenner, St. Joseph, and Victor W. Cuthbert, Sodus, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 24, 1977, Ser. No. 781,010
Int. Cl.[2] B02C *18/42*; F16L *19/03*
U.S. Cl. 4—187 A **14 Claims**



1. In a food waste disposer having an outturned top flange and lower body, improved securing means for securing the disposer to a sink in a bottom opening thereof with the disposer flange resting on the sink at the edge of said opening and with the disposer body extending downwardly therefrom through said opening, said securing means comprising:

a clamp ring adapted to be disposed about said body, said clamp ring having an upper portion adapted to engage the underside of the sink at the edge of said opening, and a lower portion defining a plurality of circumferentially related downwardly facing continuously inclined cam surfaces;

outwardly projecting shoulder means on said disposer body, said cam inclined surfaces engaging said shoulder means and urging said upper portion of the clamp ring upwardly to a clamping position as an incident of relative coaxial rotation of the clamp ring and shoulder means, whereby said clamp ring upper portion may cooperate with the disposer flange in infinitely adjustably clamping the disposer to the sink; and

means for locking the clamp ring in said adjustable clamping position.

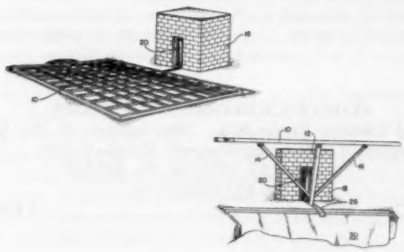
4,135,259

COVER ASSEMBLY FOR SWIMMING POOL

Anthony Scardenzan, 269 N. Hillcrest Blvd., Inglewood, Calif. 90301

Filed Feb. 6, 1978, Ser. No. 875,227
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172.11 **7 Claims**

1. A cover assembly for a swimming pool comprising: a rigid deck member configured to fit over the top of the pool; an elongated beam pivotally coupled at one end to an intermediate point on the underside of the rigid deck member; a linkage arm pivotally coupled at one end to the other end of said beam; means pivotally coupling the other end of the linkage arm to a stationary point causing the linkage arm to be in horizontal axial alignment with the beam and the beam to extend transversely across the underside of the deck member when the deck member is in position on top of the pool; and drive means coupled to the linkage arm to cause the linkage arm to swing angularly about said stationary point in a first direction to cause said beam to be displaced away from the underside of said rigid deck member and to swing from said horizontal



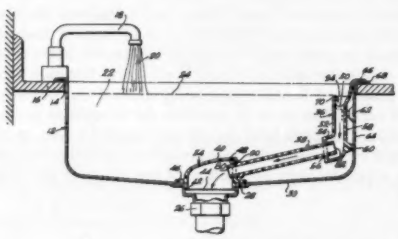
position to a vertical position thereby lifting said deck member up and away from the top of the pool, and to cause said linkage arm to swing angularly about said stationary point in a second direction to cause said beam to swing from its vertical position to its horizontal position and to be displaced towards the underside of said rigid deck member thereby returning said deck member to the top of the pool.

4,135,260

RINSE SINK SKIMMER

Peter P. Gresh, 389 Linwood Dr., Miami Springs, Fla. 33166

Filed Mar. 28, 1977, Ser. No. 781,586
Int. Cl.[2] E03C *1/244*
U.S. Cl. 4—201 **2 Claims**



1. For a sink having a drain opening in a lower portion and an upwardly extending side wall, a skimmer device comprising:

a plug means sized to nest over the drain opening and having a hollow interior with a first opening in fluid flow communication with the drain opening and a second opening facing away from the drain,

a skimmer including an open tapped, elongated upper lip and an upwardly extending hanger means to hang the lip to the sink wall and said skimmer including a downwardly extending tubular portion including a relatively long downwardly extending front face in depending relation of said skimmer and a rear and side wall, and said front face and walls converging downwardly to an exit opening, and

a tubular connector length having a first end and a second end, said first end being connected to the exit opening of the skimmer and said second end being connected to the second opening of the plug,

wherein the first end and the second end of said tubular length are sized for telescopic receipt in said exit opening of the skimmer and the second opening of the plug repsectively and wherein an annular rib is provided on said

tubular connector length adjacent the terminal end and comprises limit means to limit penetration of said tubular length in said second opening of the plug, and orienting and stabilizing means are provided on said rear skimmer face to engage the wall of the sink, wherein said orienting means includes a pair of upper and a pair of lower members extending generally perpendicularly away from said rear face

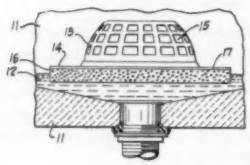
whereby scum floating to the surface of the water in the sink will be skimmed by flowing over the elongated, open tapped lip of the skimmer and through the drain opening.

4,135,261

FLOATABLE DEODORANT HOLDER

Harold Uhrman, Pepper Pike, Ohio, assignor to The State Chemical Manufacturing Company, Cleveland, Ohio

Filed Nov. 17, 1977, Ser. No. 852,564
Int. Cl.[2] E03D *9/00*
U.S. Cl. 4—222 **8 Claims**



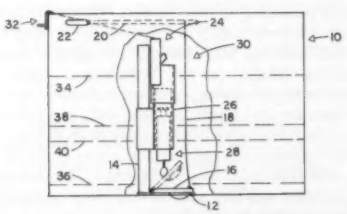
1. A floatable deodorant holder adapted to float upon a body of water residing in a urinal or the like comprising a holder including a base portion and a receptacle portion positioned over the base portion, the receptacle portion having open spaces therein for exposing a block of deodorant or the like held in the receptacle portion above the surface of the water, a block of water soluble deodorant or the like held in the receptacle portion of said holder, and a buoyant member of expanded plastic of such buoyancy as to support said holder and block on said water to hold a substantial portion of the block above the surface of said water, said buoyant member being positioned beneath, and being secured to, the base portion of said holder so as to maintain the receptacle portion of the holder and block held therein above said buoyant member, the block being suspended substantially at or above the surface of the water to limit dissolution of the block in the body of water.

4,135,262

DUAL FLUSH DEVICES FOR TOILETS

Charles A. Overbey, 16 Bougainvillea Dr., Cocoa Beach, Fla. 32931

Filed Aug. 1, 1977, Ser. No. 820,418
Int. Cl.[2] E03D *5/092*
U.S. Cl. 4—325 **3 Claims**



1. A water-saving device for a toilet having a water tank, an outlet valve to discharge water from said tank and a mechanism for operating said outlet valve to substantially empty the water from said tank, comprising:

(A) a float movably mounted in said tank to selectively close said outlet valve;

(B) a retaining device mounted in said tank to normally prevent said float from closing said outlet valve when said mechanism is operated to substantially empty the water from said tank;

(C) a control apparatus connected to said retaining device for selectively releasing said retaining device to permit said float to prematurely close said outlet valve to effectuate only a partial emptying of the water from said tank; and

(D) means for varying the effective length of said float to readily preselect the most optimum premature closing of said outlet valve and thereby retain a water level in said tank corresponding to the maximum water savings that said toilet is capable of producing;

(E) said means for varying the effective length of said float includes:

(1) a body portion slidably mounted in a bottom portion of said float;

(2) a vent slot in said body portion;

(3) a rounded end portion mounted on said body portion; and

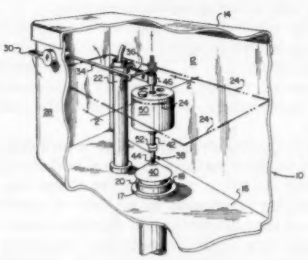
(4) a weight carried in said rounded end portion.

4,135,263

DUAL FLUSH TOILET MECHANISM

John K. Anderson, Richardson, Tex. 75080

Filed Sep. 16, 1977, Ser. No. 833,760
Int. Cl.[2] E03D *1/35*
U.S. Cl. 4—324 **9 Claims**



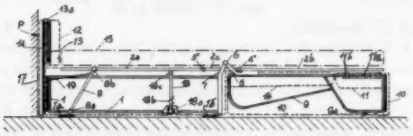
1. An improved dual volume flush control device of the type coupled to the flush valve of commode tanks having a drain valve seat, a float-type flexible valve including a valve stem, said valve adapted for engaging said valve seat, a secondary float mounted on said valve stem so as to effectively ride on said flexible valve and sink it prior to the surface of the water in said flush tank reaching the top of said flexible valve, wherein the improvement comprises said secondary float being constructed in a cupshaped configuration disposed on said stem in an inverted position having an open ended bottom and controllably vented top, said cup entrapping water and air therewithin and including an upper orifice for communicating with the atmosphere and permitting the entrapped water in the cup to weight said flexible valve in one mode of operation and to vent and selectively equalize with the water level of the commode tank in a second mode of operation, while in either mode maintaining said entrapped air within said float.

4,135,264

DIVAN OR EASY CHAIR CONVERTIBLE INTO A MADE BED

Ambrogio Busnelli, Milan, Italy, assignor to B & B Italia S.p.A., Milan, Italy

Filed Jul. 25, 1977, Ser. No. 818,458
Claims priority, application Italy, Sep. 17, 1976, 27337 A/76
Int. Cl.[2] A47C *17/10*
U.S. Cl. 5—45 **9 Claims**



1. A couch or easy chair convertible into a bed, which comprises

a. a head board,

b. a fixed base including two like lateral frames extending from the head board, each of the lateral frames having a length and a height,

c. a mobile, spring supporting frame mounted on the base and extedning between the two lateral base frames, the mobile frame being divided into three parts,

1. a first one and a second one of the mobile frame parts having a length not exceeding the length of the lateral base frames,

2. an intermediate one of the mobile frame parts between the first and second frame parts, the intermediate frame part having a length less than the height of the lateral base frames,

3. a first hinge means interconnecting the first and intermediate frame parts and permitting the intermediate frame part to be pivoted in relation to the first frame part about an axis extending substantially parallel to the head board, and

4. a second hinge means interconnecting the intermediate and second frame parts and permitting the second frame part to be pivoted in relation to the intermediate frame part about an axis extending substantially parallel to the head board, the second hinge means being arranged to limit the pivoting of the second frame part to an angle not exceeding about 90°, the intermediate and second frame parts being pivotal about the first and second hinge means between a folded position, wherein the first and second frame parts extend substantially parallel to each other and are spaced apart by the intermediate frame part extending substantially parallel to the head board, and a "bed" position, wherein the three frame parts extend substantially in a plane projecting substantially perpendicularly to the head board, and

d. independent support means for supporting each of the first and second frame parts in the "bed" position, each of the support means being connected to a respective one of the frame parts.

4,135,265

BEE HIVE

Herman Van de Kerkof, 4576 Cliffmont Rd., North Vancouver, British Columbia, Canada (V7G 1J9)

Filed Jun. 16, 1977, Ser. No. 807,280
Int. Cl.[2] A01K *47/00, 47/06*
U.S. Cl. 6—1 **24 Claims**

1. A bee hive comprising:

a bottom section having a removable front wall, a removable rear wall and two side walls;

a closeable bee entrance in the front wall;

inclined boards extending upwardly from the front and rear walls to meet at about the center of the top of the side walls to define a first space beneath the boards and a second space above the boards;

internal vents in the side walls to permit air flow between the first space and the second space;

at least one closeable vent in each side wall to communicate the first space with the exterior of the bottom section;

at least one closeable vent in the rear wall to communicate the second space with the exterior of the bottom section;

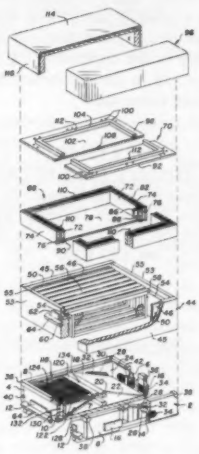
a hive section having (a) inner and outer side walls spaced to define ventilation channel at the sides of the hive section and (b) end walls;

means on said end walls in said hive section to suspend a plurality of bee hive frames;

a closeable entrance in at least one end wall of said hive body section;

a top section comprising in combination;

i. an inner cover having inner and outer walls to define an inner space and ventilation channels around its periphery to communicate with the hive section below, the channels at the sides of the inner cover aligning with the ventilation channels in the hive section below;



a base in the inner cover adjacent the lower edges of the inner walls;

ii. a reversible inner lid comprising a flat board having first and second sides;

projections formed on the first side;

ventilation openings around the periphery of the lid to align with the channels in the inner cover;

an upstanding wall formed on the second side to align with the inner walls on the inner cover below and to space said second side away from the inner cover to define ventilation openings at the top of the ventilation channels in the inner cover;

iii. an outer lid comprising a top having walls to define an area larger than the area of the inner lid whereby the outer lid can be moved in the direction of the wind direction in order to facilitate ventilation, the outer lid being supported by the projections of the inner lid or the wall of said inner lid depending on the ventilation required.

4,135,266

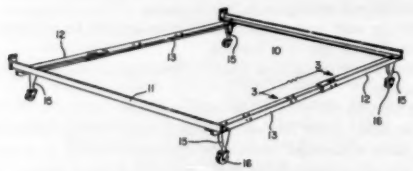
ADJUSTABLE BED FRAME

Silas J. Knoke, Seymour, Ind., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 6, 1977, Ser. No. 785,079
Int. Cl.[2] A47C *19/00*
U.S. Cl. 5—201 **6 Claims**

1. In a bed frame having adjustable angle iron end rails, the

improvement comprising an outer end rail having an upper generally horizontal leg and a depending leg, and an inner end rail having a portion thereof interfitted in overlapping relation to said outer end rail, and also having an upper generally horizontal leg in underlying relation to the corresponding leg of the outer rail and having a depending leg positioned adjacent the corresponding leg of the outer rail, and means in each of said upper horizontal legs and depending legs defining



aligned openings with the openings formed in each of said upper and depending legs being in general transverse alignment with each other, and a retaining pin member extending diagonally from a position above the horizontal leg of said outer rail through said aligned openings and terminating at a position outwardly of the depending leg of said outer rail to capture said inner rail in predetermined longitudinal position with respect to said outer rail.

4,135,267

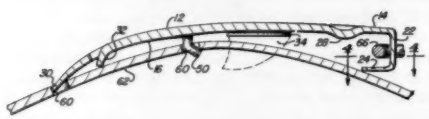
UTILITY BELT BUCKLE

Kenneth D. McKinney, Sr., and Kenneth D. McKinney, Jr., both of Box 23A, Rte. 2, Apache Junction, Ariz. 85220

Filed Jul. 5, 1977, Ser. No. 812,789

Int. Cl.[2] B25F *1/00*

U.S. Cl. 7—151 **6 Claims**



1. For use in combination with a belt having eyelet apertures spaced longitudinally along one end thereof:

a pair of rigid loops carried at an opposite end of said belt, said pair of loops being secured together and extending generally laterally across said opposite end of the belt, one of said pair of loops arranged for receiving said one end of said belt in underlying relationship to said opposite end of the belt; and

a unitary buckle underlying said belt and including a major body with a lower surface thereof extending longitudinally along in overlying relationship to said belt, said buckle including a first rigid stretch integral with one end of said body and extending laterally across the width of said one end of the body, said first stretch depending transversely downwardly from said one end of the body, said buckle further including a second rigid stretch integral with said first stretch and extending longitudinally therefrom in underlying, transversely spaced relationship to said lower surface of the major body, said second stretch being readily inserted into and removed from the other of said pair of loops for releasably interlocking said other of the pair of loops with said first and second stretches to facilitate rapid assembly and disassembly of said buckle to said belt, said second stretch having a semicircular cut-out and said major body having a protrusion on said lower surface facing said cut-out, whereby said major body and said second stretch together present a prying-type bottle lid remover.

4,135,268

PROCESS FOR THE UNIFORM DYEING OF TEXTILE WOUND PACKAGES OR PACKAGED MATERIAL

Hans-Ulrich von der Eltz, Frankfurt am Main, and Siegfried Glander, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,532

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656527

Int. Cl.[2] D06B *5/16*

U.S. Cl. 8—155.1 **9 Claims**

1. A process for creating uniform flow conditions for circulating liquors flowing through textile wound packages or packaged material of synthetic and/or natural fibers in the course of machine dyeing by the exhaustion method under elevated pressure, wherein the zones of liquor flow which deviate from a mean value are determined across the entire block of material by measuring the differential pressures within the wound packages of material at several pairs of positions, whereupon the localized flow differences are equalized in all positions of the block of material by altering the properties and structures of the packages of material, by modifying the dyeing program, by varying the pumping power, by design changes in the dyeing machine and/or by special selection and optimum metering of auxiliaries.

4,135,269

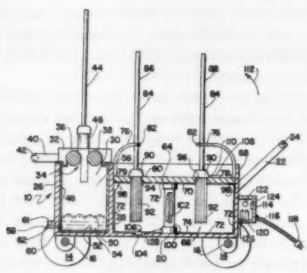
MOP STERILIZER AND DRYER

Laurel L. Marston, 926 New York Ave., Brooklyn, N.Y. 11203

Filed Nov. 18, 1977, Ser. No. 852,827

Int. Cl.[2] A61L *3/00*; A47L *13/60*

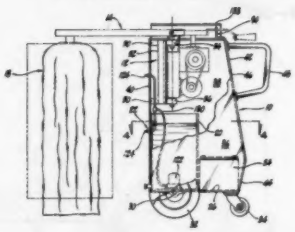
U.S. Cl. 15—4 **9 Claims**



1. A mop sterilizer and dryer comprising a wheeled cart, said cart having a first compartment and a second compartment disposed in side-by-side relationship bounded by upstanding walls and defining at the top thereof a first open-mouth portion and a second open-mouth portion of said first compartment and said second compartment, respectively, a first removable cover and a second removable cover, said first cover and said second cover partially covering said first open-mouth portion and said second open-mouth portion respectively, a pair of wringer rollers, said pair of rollers being disposed in spaced-apart parallel relationship and journaled to said first cover, a crank handle, said crank handle carried by one of said pair of rollers, a removable liner underlying the rollers, said removable liner configured to and residing within said first compartment, means to drain said first compartment and said liner, at least one opening in said second cover, an ultraviolet generating lamp, said ultraviolet generating lamp being disposed and carried within said second compartment, said second compartment and a lowermost surface of said second cover being covered with an ultraviolet light ray reflecting medium, means to energize said lamp, means to maintain the handle of a cord type mop in a vertical direction over said at least one opening in said second cover whereby the cord end of said mop may be

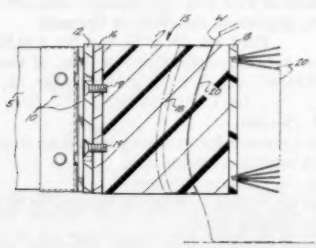
disposed through said at least one opening in said second cover and within said second compartment.

4,135,270
PORTABLE CARWASH APPARATUS
Earl L. Miner, Long Lane, Mo., assignor to Detroit Tool & Engineering Co., Lebanon, Mo.
Filed Mar. 3, 1977, Ser. No. 773,849
Int. Cl.[2] B60S *3/06*
U.S. Cl. 15—53 A **14 Claims**



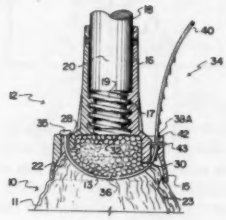
1. In a trackless portable carwash apparatus:
(a) a portable body means having opposed sides and including pivot mounting means disposed intermediate said sides and defining a substantially vertical pivot axis,
(b) brush support means including a substantially horizontal boom means having a depending post means fixedly attached thereto, said post means being mounted to the body for manual swinging movement of the boom means about the pivot axis from an operating position on one side of the body to an operating position on the other side of the body,
(c) brush means mounted to the boom means forwardly of the body for rotation about a substantially fixed axis disposed in spaced relation from the pivot axis for swinging movement with the boom means, and
(d) drive means carried by the support means and connected in drive relation to the brush means.

4,135,271
TIRE CLEANING BRUSH
Maurice R. Harding, 8540 SW. Spruce St., Portland, Oreg. 97223, and David D. Teeney, 14334 NE. Sandy Blvd., Portland, Oreg. 97230
Filed Aug. 1, 1977, Ser. No. 820,693
Int. Cl.[2] B60S *3/04*
U.S. Cl. 15—53 B **1 Claim**



1. In combination,
an automobile tire cleaning apparatus having a series of yieldable connector plates each terminating in supporting attachment to a brush supporting rigid strip, a motor and eccentric means for imparting rapid rectilinear motion to said strip, and
a brush structure including an attachment strip, fasteners in place along said attachment strip removably securing same to said brush supporting rigid strip, a foamed cellular member carried by said attachment strip, a flexible backing strip in place on said cellular member and having bristles thereon for scrubbing contact with a tire sidewall along a rectilinear path.

4,135,272
MOP CONNECTOR
Reginald M. Stephenson, Winnipeg, Canada, assignor to Atlas-Graham Industries Company Ltd., Winnipeg, Canada
Filed Apr. 18, 1977, Ser. No. 788,260
Int. Cl.[2] A47L *13/24*
U.S. Cl. 15—147 R **4 Claims**

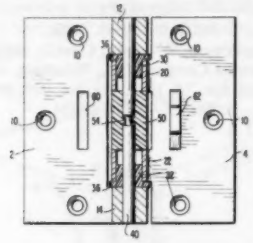


1. A mop connector for a string type mop head having a central portion comprising in combination a handle receiving end and a mop head receiving end, and means to secure the associated mop head into said mop head receiving end, said means including a flexible strap held by one end thereof to one side of said mop head receiving end and adjustably secured in locking relationship to the other side of said mop head receiving end, said strap passing around the central portion of the associated mop head and holding same firmly within said mop head receiving end and a slot formed through adjacent the upper side of said mop head receiving end and on the other side thereof, a plurality of ratchet teeth type projections formed on the outer side of said strap, said ratchet teeth type projections operatively engaging the boundary of said slot when said other end of said strap is pulled through said slot thereby locking said strap against disengagement from said slot, said mop head receiving end being substantially hollow dome-shaped, and means projecting downwardly from adjacent the upper inner surface of said mop head receiving end engageable within the central portion of said mop head to prevent relative movement between said mop head and said connector when said mop head is installed therein.

4,135,273
HINGE WITH INTERFITTING LOCKING MEANS
Stannard D. Holmes, Box 331, Naranjito, P.R. 00719
Filed Jan. 23, 1978, Ser. No. 871,442
Int. Cl.[2] E05D *5/12*
U.S. Cl. 16—169 **3 Claims**

1. A hinge comprising first and second leaves of substantially equal length, an unheaded hinge pin pivotally connecting the leaves along adjacent edges and being substantially equal in length to the leaves, the first leaf having two spaced aligned cylindrical bosses positioned at the opposite ends thereof and having aligned openings therethrough of the same diameter as the hinge pin, the second leaf having two spaced aligned cylindrical bosses positioned between the bosses of the first leaf and being of such length and position that their outer end surfaces are respectively spaced from the inner end surfaces of the bosses of the first leaf and having aligned openings therethrough which are of larger diameter than the diameter of the hinge pin, a headed bushing within each boss of the second leaf having its head within and filling the space between the bosses of the first and second leaves with which it is associated, each of said bushings having an opening therethrough of the same

diameter as the hinge pin, a cylindrical retainer separate from the two leaves formed of a resilient material and positioned between the bosses of the second leaf and having an axial opening therethrough aligned with the openings through the bosses of the first leaf and those through the bushings and the



diameter of which is such that the hinge pin is resiliently engaged by the material of the retainer and relative rotation between them is permitted, the hinge pin extending through the aligned openings in the bosses of the first leaf, the openings in the bushings in the bosses of the second leaf and the opening in the retainer.

4,135,274

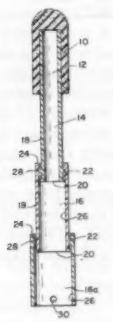
LIQUID APPLICATOR

Catherine Freeman, 1662 Bayview Ave., Bronx, N.Y. 10465

Continuation-in-part of Ser. No. 769,508, Feb. 17, 1977, abandoned. This application Mar. 8, 1978, Ser. No. 884,535

Int. Cl.[2] **A45D** *34/04;* **B25G** *1/04*

U.S. Cl. 15—244 R **3 Claims**



1. A liquid applicator, comprising a plurality of hollow walled open ended handle members, each member having a predetermined external and internal diameter, said members communicating with each other in series, each succeeding member having an internal diameter larger than the external diameter of the preceding member, said members being telescopically movable one into the other, first means disposed on the outer wall of one of said members adjacent the distal end thereof for arresting the movement thereof, second means disposed on the inner wall of said next succeeding member adjacent the proximate end thereof for arresting the movement thereof by cooperating with said first means, said first and second means forming a detent, flange means disposed on said outer wall of said one of said members at the distal-most end thereof for preventing the disengagement of said one of said members from said next succeeding member by cooperating with said second means, a unitary absorbent pad member disposed on the front end of the first of said members, said unitary liquid absorbent pad member being a sponge-like rubber-like material, wherein said pad member is a hollow sleeve open at one end for receiving said front end therein, and wherein said first means is a rib and said second means is a groove.

4,135,275

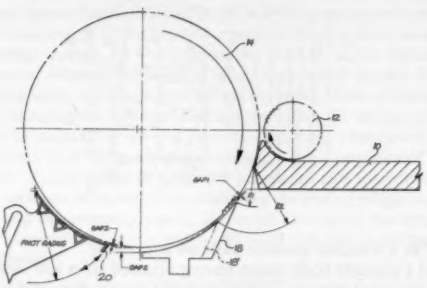
HIGH SPEED CARD

Josef K. Gunter; Thomas R. Jones, and Phillip E. Dabbs, all of Durham, N.C., assignors to Gunter & Cooke, Inc., Durham, N.C.

Continuation-in-part of Ser. No. 727,233, Sep. 27, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,618

Int. Cl.[2] **D01G** *15/76*

U.S. Cl. 19—107 **3 Claims**



1. Carding apparatus for fiber feed stock comprising; a feed roll and feed plate for said stock, a lickerin thereat operated at a speed in the range of 1400 to 2000 r.p.m. and a related cylinder operated at a speed such that the lickerin surface speed is in the order of 90% of the cylinder surface speed, a stripper bar set below the lickerin having a nose and a trailing end, said nose being positioned in the range of about 30° to 45° from the point of fiber release of the feed plate, said stripper bar having a concave fiber support surface in juxtaposition with and extending incrementally away from said lickerin from said nose to said trailing end, a lickerin screen additionally set below said lickerin having a nose positioned at about 90° from the point of fiber release at the feed plate whereby the centrifugal force available at such lickerin speeds acts to remove trash particles from the feed stock and the stock being fed for carding is predominantly freed of undesirable trash particles present but so that unusable fiber contained in the feed stock is predominantly retained on the lickerin and cylinder surfaces.

4,135,276

APPARATUS FOR REMOVING IMPURITIES FROM FIBROUS MATERIAL

Karl Handschuch, Lippertshofen, and Reinhard König, Kösching, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,556

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1976, 2634769; Aug. 3, 1976, 2634768; Mar. 23, 1977, 2712650

Int. Cl.[2] **D01G** *9/12, 9/08, 9/16*

U.S. Cl. 19—204 **11 Claims**

1. An apparatus for removing impurities from fibrous material such as cotton, comprising:

a first clothed driven roller;

means for feeding said fibrous material to be cleaned to said first clothed roller;

a second clothed driven roller following said first clothed roller in fiber transfer relation with said first clothed roller;

a rotating cylindrical cage;

air stream means for supplying said fiber material from said second clothed roller to said rotating cylindrical cage;

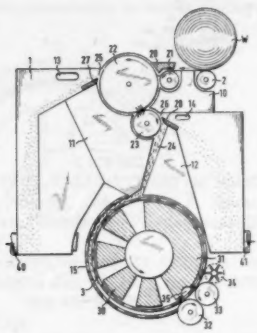
a housing closely surrounding said first and second clothed rollers;

an opening provided in said housing adjacent said first clothed roller through which impurities are expelled from

said fibrous material as said fibrous material is transported by said first clothed roller;

an opening provided in said housing adjacent said second clothed roller through which impurities are expelled from said fibrous material as said fibrous material is transported by said second clothed roller;

said second clothed roller cooperating with said first clothed roller for completely transferring said fibrous material from said first clothed roller and opening said fibrous material,



said first and second clothed rollers being driven so that the centrifugal forces at the periphery of said second clothed roller are greater than at said first clothed roller, and

said rotating cylindrical cage being spaced from said first clothed roller so that the fibrous material passing through said apparatus first engages said first clothed roller, then is transferred to said second clothed roller where said air stream means removes said fibrous material and feeds said fibrous material to said cylindrical cage.

4,135,277

MOLDING CLIP

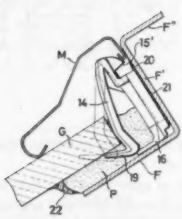
Tadayoshi Taniai, Koganei, and Takuo Yuda, Yokohama, both of Japan, assignors to Nifco, Inc., Tokyo, Japan

Continuation of Ser. No. 799,863, May 23, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,284

Claims priority, application Japan, May 25, 1976, 51-66048[U]; Aug. 3, 1976, 51-103254[U]

Int. Cl.[2] E06B *3/58*

U.S. Cl. 24—73 PC **12 Claims**



1. A one-piece plastic molding clip including a generally planar base plate adapted to be attached on its back side by adhesive means to the window opening flange in an automobile, at least one engaging arm attached at one end to a first edge of said base plate and extending substantially parallel to and in spaced relation to the plane of the central portion of said base plate, and at least one arm being provided at the free end thereof with a molding-engaging snap catch, and at least one resilient receiving member disposed in spaced relation to the front side of said base plate and connecting means permitting it to extend from adjacent the upper edge of the base plate opposite said first edge downwardly in spaced relation to the front side of said base plate in the direction of said first edge and provided at the opposite leading end thereof with a receiving portion adapted to resiliently receive the edge of a plate of glass.

4,135,278

AUTOMATIC TOOL CHANGING DEVICE FOR A MACHINING CENTER

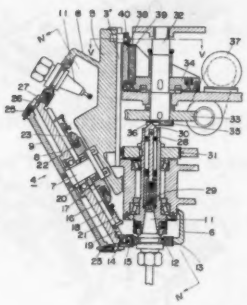
Koichiro Kitamura, 11-5 Ekinan-3-chome, Takaoka, Japan

Filed Jul. 19, 1977, Ser. No. 817,529

Claims priority, application Japan, Jul. 27, 1976, 51-89327

Int. Cl.[2] B23Q *3/157*

U.S. Cl. 29—26 A **4 Claims**



1. In an automatic tool changing device for a machining center having a bed, a table for workpieces, a column, a movable head, a cutter head and a tool rack, the improvement comprising:

said tool rack including a rack base, and a casing integral with said rack base, said casing having a peripheral portion, guide rail means on said movable head for guidable displacement of said rack base, a fixed shaft projecting from said rack base, a disk rotatably mounted on said fixed shaft and having a peripheral portion, defining an annular channel with the peripheral portion of said casing, a plurality of movable plates received in said annular channel for movement along the edge of said annular channel, each of said movable plates being adapted to rotatably hold a tool holding arbor, and means for maintaining a predetermined angle between the movable plate in the lowest position of said annular channel and the movable plates located on both sides of said movable plate in the lowest position;

a cutter head spindle having a lowermost portion with a socket for receiving the shank of each said arbor and chuck means in said spindle adapted to be opened and closed for firmly holding a forward end of each said arbor, drive means for driving said cutter head spindle at reduced speed; and

a ratchet means for rotating said tool rack through said pre-determined angle, means for opening and closing said chuck means, means for vertically moving said rotary tool rack to remove said tool arbor from said cutter head spindle and insert another of said tool arbors into said cutter head spindle, a cam mechanism including a first cam operatively associated with said ratchet means, a second cam operatively associated with said means for opening and closing said chuck means in said cutter head spindle, a third cam operatively associated with said means for vertically moving said rotary tool rack and driven cam shaft means operatively associated with said cams for controlling the operation thereof and of the timing of the respective means associated with said cams in the course of one revolution of the cam shaft means.

4,135,279

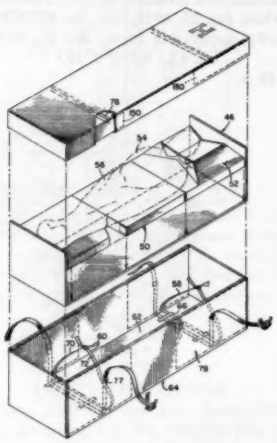
LIGHTWEIGHT, DISPOSABLE TRANSPORTATION CASKET

William P. Covington, Burnsville, Minn., assignor to National Car Rental System, Inc., Minneapolis, Minn.

Division of Ser. No. 767,824, Feb. 11, 1977. This application Mar. 23, 1978, Ser. No. 889,374

Int. Cl.[2] A61G 17/00

U.S. Cl. 27—4 **4 Claims**



1. An integral foldable shell cover forming blank comprising:

a rectangular central panel;

a pair of rectangular side panels each foldably connected along one side edge thereof to one side edge of said central panel;

a pair of rectangular side flaps each foldably connected along one side edge thereof to the other side edge of each of said side panels;

a pair of rectangular end flaps each foldably connected at one side edge thereof to an end edge of said central panel, said end flaps each having the end edges thereof essentially co-linear with the other side edges of said side flaps and being separated from the end edges of said side flaps and said side panels by cut lines, said end flaps each having a pair of break lines extending transversely thereof and being essentially co-linear with said side panel one side edges to define insert tabs.

4,135,280

METHOD AND APPARATUS FOR TEXTURIZING CONTINUOUS FILAMENTS

Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Alfred L. Liland, Lake Shawnee, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 619,085, Oct. 2, 1975, Pat. No. 4,024,611. This application May 23, 1977, Ser. No. 799,628

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] D02G 1/20, 1/16, 1/12

U.S. Cl. 28—257 **22 Claims**

1. Apparatus for crimping continuous filaments comprising:

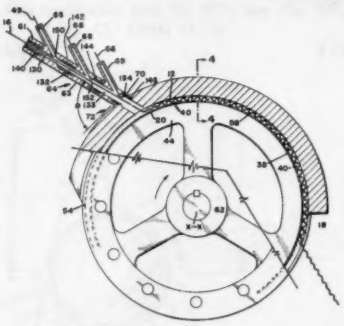
(a) a chamber having an inlet opening for receiving the filaments and an outlet opening for withdrawing the filaments;

(b) barrier means disposed in said chamber adjacent said inlet opening;

(c) fluid directing means for directing a stream of compressible fluid from a conduit containing said filaments into contact with said barrier means to initiate crimping thereof;

(d) fluid escape means associated with said chamber for separating the major portion of said fluid from said filaments and expelling it from said chamber;

(e) carrier means for transporting said filaments through said chamber, including a continuously moving surface associated with said chamber to cause overfeeding of said filaments into said chamber, said filaments being forced against a mass thereof within said chamber to produce crimps therein; and



(f) heating means connected to and upstream of said fluid directing means and downstream of said conduit for contacting said filaments with heated fluid in a second conduit of increased cross-sectional area to increase the temperature of the filaments.

4,135,281

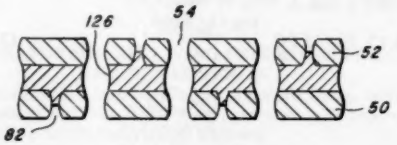
METAL-DIELECTRIC ELECTRON BEAM SCANNING STACK

William G. Manns, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 2, 1976, Ser. No. 746,909

Int. Cl.[2] H01J 9/02

U.S. Cl. 29—25.14 **7 Claims**



1. A method of fabricating an electron beam scanning stack comprising the steps of:

fabricating a matrix of apertures in a first and second plurality of metal plates having first and second planar surfaces;

fabricating a groove pattern in said first planar surface of at least two of said first plurality;

coating said first surface having said groove pattern with dielectric material;

aligning said apertures of said first plurality having said groove pattern to form a matrix of electron channels therein;

bonding said plates having said groove pattern together by means of said dielectric material;

fabricating said groove pattern into an isolation channel from said second planar surface of said first plurality, thereby fabricating a subassembly;

coating said first planar surface of at least one of said second plurality with dielectric material;

aligning said apertures of at least two of said second plurality forming a matrix of electron channels therein, at least one of said second plurality having said dielectric coating thereon;

bonding said second aligned plurality together by means of said dielectric material to form a matrix of electron channels therein;

aligning said electron channels of said subassembly with said electron channels of said bonded second plurality; and

bonding said bonded second plurality to said second planar surface of said subassembly by means of a layer of dielectric material.

4,135,282

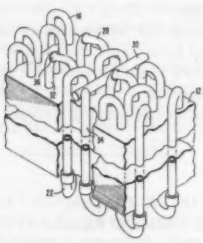
FINNED TUBE COIL AND METHOD OF MAKING SAME

Edward C. Neff, Norman, and Howard F. Spicer, Oklahoma City, both of Okla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 580,506, May 23, 1975, Pat. No. 4,053,014. This application Jun. 16, 1977, Ser. No. 806,973

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 A **2 Claims**



1. In the method of making a multi-row, finned tube coil of apertured aluminum fins, hairpin-shaped aluminum tubes, aluminum return bends, and complex fittings of the class including tripods and inlet and outlet headers, comprising the steps of:

assembling the tubes and fins with all of the bight ends of the hairpin-shaped tubes, and the complex fittings, at one end of the coil, and assembling only return bends to the open ends of the tubes projecting through the fins at the other end of the coil, and then

soldering all of said return bends to the ends of said hairpin-shaped tubes.

4,135,283

RESILIENT STRUCTURAL MEMBER SUCH AS A PLATE SPRING

Ernst Kohlhage, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen u. Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

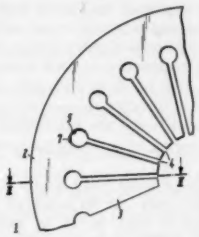
Continuation of Ser. No. 624,286, Oct. 20, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,788

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1974, 2450267

Int. Cl.² F16F *1/32*; C21D *7/06*

U.S. Cl. 29—173 **9 Claims**

1. Method of producing a resilient structural member such as a plate spring which comprises tempering the member, then directing a stream of particles to impinge on a surface portion of the member so as to harden and roughen the surface portion of the member, and thereafter smoothening to at least a partial



extent the material of the roughened surface formed by the impingement of the stream of particles.

4,135,284

TOOL FOR MOUNTING RETAINING RINGS ON A SHAFT

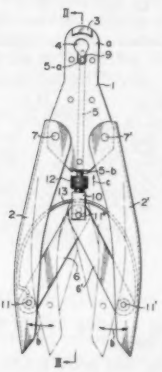
Yakayuki Nakamoto, Tokyo, Japan, assignor to Iwata Electric Works, Ltd., Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,870

Claims priority, application Japan, Jun. 4, 1977, 52-72964

Int. Cl.² B23F *19/04*

U.S. Cl. 29—229 **5 Claims**



1. A tool for mounting and demounting split retaining rings comprising a base plate, a pair of gripping levers pivotally mounted on one end of said base plate, the other end of said base plate being elongated and having a shaft accommodating hole passing therethrough, an abutment means protruding from one side of said elongated end of said base plate between said hole and the end of said elongated end, and a moveable camming means positioned in a slot-like portion of said hole and projecting in the same direction as said abutment member, and means connecting said gripping levers with said camming means so that squeezing said gripping means causes said camming means to be actuated toward said abutment means whereby a split retaining ring held between said camming means and said abutment means may be expanded to be mounted or demounted on a shaft.

4,135,285

METHOD AND APPARATUS FOR ASSEMBLING SLIDE FASTENER SLIDERS

Lewis Weiner, 87-08 Santiago St., Holliswood, N.Y. 11423

Filed Nov. 14, 1977, Ser. No. 851,155

Int. Cl.² B29D *5/00*

U.S. Cl. 29—409 **39 Claims**

1. Apparatus for assembling lock sliders for slide fasteners,

an assembled lock slider being comprised of a slider body having upper and lower pairs of laterally spaced lugs on the front face thereof, a pull tab having a slotted opening therein through which one pair of said body lugs are received, said pull tab further having a trunnion part extending across said body front face between said pairs of lugs, and a spring having a main body part received over said trunnion and extending intermediate the lugs of each said pair, said spring further having a rearwardly directed prong part received through an opening in the slider body, the extremities of said lugs being staked over said spring main body part, said apparatus comprising

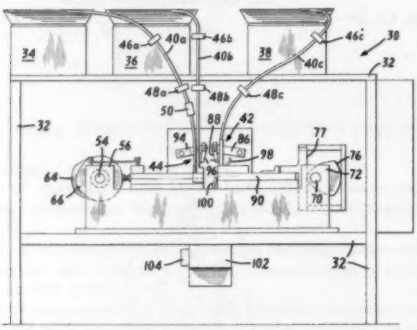
means comprising a slider body holder including an anvil on which a slider body can be received in upright position with the pairs of lugs facing an assembly station, said means being movable between a first slider body loading position at a loading station and a second position at the assembly station,

means for feeding a slider body from a source of such bodies onto said anvil when first-mentioned means is in its first position,

means for holding a pull tab in upright position at said assembly station,

means for feeding a pull tab from a source of such pull tabs to said pull tab holder,

means for holding a spring adjacent said assembly station with the prong part proximate said pull tab,



means for feeding a spring from a source thereof to said spring holding means,

means for moving said body holder means to its second position in which one pair of the lugs of the slider body mounted on on said anvil are received through the slotted opening in the pull tab in said pull tab holder and said pull tab trunnion is disposed between said upper and lower lug pairs,

means engageable with the spring in said spring holding means and operable when said body holder means is in its second position to insert said spring main body part over said pull tab trunnion and between the pairs of lugs on said slider body with the prong part thereof received through the opening in said slider body,

clenching means operable upon insertion of said spring main body part between said pairs of lugs for clenching the extremities of said lugs over said spring main body part thereby to fixedly secure said spring and said pull tab to said body,

means operable to retract said body holder means from its second position at the assembly station to its first position at the loading station following operation of said clenching means, and means operable during the movement of said body holder means from its second to first positions to remove the assembled slider from said anvil.

32. A method for assembling lock sliders for slide fasteners, as assembled lock slider being comprised of a slider body having upper and lower pairs of laterally spaced lugs on the front face thereof, a pull tab having a slotted opening therein through which one pair of said body lugs are received, said pull tab further having a trunnion part extending across said body front face between said pairs of lugs, and a spring having a main body part received over said trunnion and extending intermediate the lugs of each said pair, said spring further having a rearwardly directed prong part received through an opening in the slider body, the extremities of said lugs being staked over said spring main body part, said method comprising

feeding a spring and a pull tab to an assembly station from respective in-line stock sources thereof,

positioning said spring and said pull tab in upright disposition at said assembly station with the spring located to one side of said pull tab,

feeding a slider body from an in-line stock source of such bodies to a loading station located at and spaced from the other side of said pull tab and receiving said body on an anvil at said loading station,

moving said anvil from its position at the loading station to a position at the assembly station in which said one pair of lugs on the body extends through the slotted opening in the pull tab and the trunnion pull tab locates between the upper and lower pairs of lugs, and holding said anvil at said moved position thereof,

then inserting said spring main body part over said pull tab trunnion and between the pairs of lugs on said body with the prong part thereof received through the opening in said slider body,

applying a force to the extremities of said lugs to clench them over said spring main body part,

returning said anvil to said loading station, and

removing the assembled slider from said anvil while it is being returned to said loading station.

4,135,286

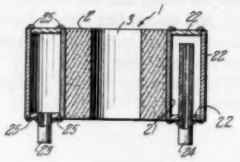
SPUTTERING TARGET FABRICATION METHOD

Robert J. Wright, Tequesta; Ralph J. Hecht, West Palm Beach, and Richard J. Fenton, Palm Beach Shores, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1977, Ser. No. 863,120

Int. Cl.[2] B22F *3/24*

U.S. Cl. 29—420 **3 Claims**



1. A method for fabricating a fluid cooled sputtering target including the steps of:

a. providing a toroidal container formed from a ductile metal;

b. filling the container with a powder material whose composition is that of the desired target;

c. evacuating the filled container and sealing it so as to maintain the powder filled container in an evacuated condition;

d. isostatically compacting the container at an elevated temperature selected so that the powder is densified and bonded to the container;

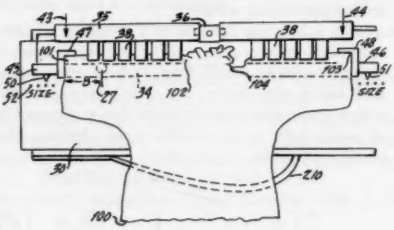
e. removing the container from the densified powder material except for a remnant around the outer periphery;

f. joining a fluid cooling means to the outer contour remnant.

4,135,287
METHODS OF ATTACHING SNAP FASTENERS

Herbert M. Silverbush, Cranston, R.I., assignor to Rau Fastener, A Division of U.S. Industries, Inc., Providence, R.I.

Division of Ser. No. 761,807, Jan. 24, 1977, Pat. No. 4,090,652.
This application Jan. 16, 1978, Ser. No. 869,853
Int. Cl.[2] A41H *37/04*
U.S. Cl. 29—432 25 Claims



1. A method for attaching snap fastener parts along an irregularly shaped material edge located between a first end and a second end, comprising the steps of:

(a) first clamping said material from said first end towards said second end for a given distance along said edge,

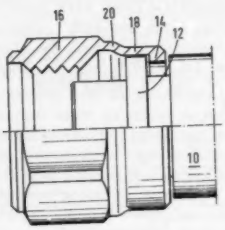
(b) then clamping said material from said second end towards said first end for a given distance along said edge whereby all material not clamped is accumulated between said first and second ends, and

(c) emplacing snap fastener parts at predetermined intervals only along said clamped edges in a direction commencing from said first end to said second end whereby said material not clamped has no fastener parts attached thereto.

4,135,288
METHOD OF SECURING HF-COAXIAL CONNECTOR WITH A COUPLING RING

Franz X. Pitschi, Rottach-Egern, Fed. Rep. of Germany, assignor to Spinner GmbH, Fed. Rep. of Germany

Filed Aug. 23, 1976, Ser. No. 716,580
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1975, 2546942
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—443 1 Claim



1. A process for permanently securing a coupling ring onto an HF coaxial connector, comprising:

providing a connector body having an outer flange with a first external diameter, over which outer flange a coupling ring is to be past;

providing a coupling ring having a sleeve-like end section, into which said outer flange of said connector body is to be past, said sleeve-like end section having a second uniform outer diameter and terminating in an inner flange which is to be fastened behind said outer flange of said connector body for thereby coupling said coupling ring to said connector body; said inner flange having a first internal diameter which is greater than said first external of said coupling ring outer flange, said sleeve-like end section having a second internal diameter which is greater than said first internal diameter of said inner flange, said coupling ring also having an internally threaded section having a third internal diameter which is less than said first external diameter of said outer flange adjacent said sleeve portion;

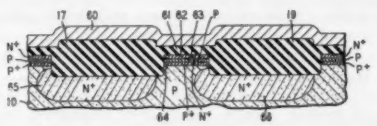
passing said connector body outer flange past said coupling ring inner flange and inside said sleeve-like end section; and

then compressing, by rolling, only a portion of said sleeve-like end section radially inward to form a cylindrical portion having a third uniform outer diameter which is less than said second uniform outer diameter of said sleeve like end section such that a conically tapered transition portion is formed between the portion of said sleeve-like end section which is not compressed by rolling and said portion of said sleeve-like end section which is compressed by rolling, said third uniform outer diameter of said compressed portion of said sleeve-like end section being sufficiently small that said inner flange comes to rest beyond said outer flange with a third internal diameter that is smaller than said first external diameter of said outer flange.

4,135,289
METHOD FOR PRODUCING A BURIED JUNCTION MEMORY DEVICE

John R. Brews, New Providence, and Dawon Kahng, Bridgewater Township, Somerset County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 23, 1977, Ser. No. 827,105
Int. Cl.[2] H01L *21/26*
U.S. Cl. 29—571 3 Claims



1. A method for making a semiconductor memory device which comprises the steps of:

a. forming at least first and second recess regions in an initially flat portion of a major surface of a semiconductor body of one conductivity type, leaving a first flat surface portion of the body separating said recess regions;

b. introducing a first impurity of the opposite conductivity determining type into a different limited region of each of said first and second recess regions, each said limited region being noncontiguous with said first flat surface portion, said first recess region having a smaller distance of nearest approach to said flat surface portion than said second recess region, said first and second recess regions being contiguous with the exposed surface of each said recess region, in order to form a different impurity zone in each recess region, the remaining semiconductor body and each said zone forming a different PN junction which is noncontiguous with the said first flat surface portion;

c. thermally growing an oxide of the semiconductor over the exposed surface of said recesses, each of said PN junctions remaining noncontiguous with said first flat surface portion;

d. introducing significant impurities of said one conductivity determining type to a first predetermined depth in the body beneath said first flat surface portion, extending in said body from the first to the second recess regions;

e. introducing significant impurities of opposite conductivity determining type in a region in the body including said first flat surface portion to form a channel region of said opposite conductivity type extending in the body beneath

said first flat surface portion to a second, smaller predetermined depth, said channel region connecting said first and second recess regions along the said first flat surface portion; and

f. forming an electrode overlying proximate to, but insulated from, the first flat surface portion from said first to said second recess region.

4,135,290

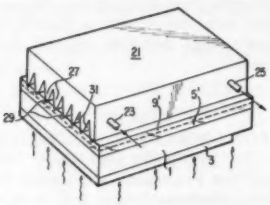
METHOD FOR FABRICATING SOLAR CELLS HAVING INTEGRATED COLLECTOR GRIDS

John C. Evans, Jr., North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 803,823, Jun. 6, 1977, Pat. No. 4,104,084. This application Dec. 23, 1977, Ser. No. 863,770

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—572 **8 Claims**



1. A method for fabricating Schottky barrier or heterojunction solar cells which comprises:

coating a heterojunction or Schottky barrier device having opposed upper and lower surfaces on most of the lower surface of the substrate of each said device with a layer of a conductive metal base layer;

coating the upper surface of said device with a metal alloy layer;

contacting said metal alloy layer with a heat sink having protruding portions which, with contiguous void spaces, define a pattern on said metal alloy layer;

oxidizing said metal alloy layer to a transparent mixed metal oxide layer only in those regions of the layer exposed to a gaseous oxidant in said void spaces thereby forming a mixed metal alloy grid network embedded with the formed oxide layer in those regions of said alloy layer in contact with said protruding portions;

providing said substrate with an insulating layer between said conductive metal base layer and said transparent conductive metal oxide layer; and

providing said grid network with a wraparound metal conductor which coats said insulating layer thereby providing a conductive metal collector for said embedded alloy grid network.

4,135,291

METHOD FOR PRODUCING SEMICONDUCTOR DEVICES WITH HIGH REVERSE BLOCKING CAPABILITY

Werner Tursky, Schwabach, Eichvasen; Madan Chadda, Nüremberg-Gaulnhofen, and Horst Schäfer, Zirndorf, all of Fed. Rep. of Germany, assignors to Semikron, Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nüremberg, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,964

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633324

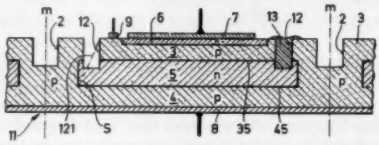
Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—574 **18 Claims**

1. A method for producing a plurality of semiconductor devices out of a semiconductor disc of a first conductivity type with the devices having a high reverse blocking capability and having a sequence of at least three layer-type zones of different conductivity types, of which at least one is highly resistive, and at least one pn-junction, comprising the steps of:

forming grooves of a depth at least equal to the desired thickness of the highly resistive zone in at least one of the major surfaces of said disc according to a desired pattern to subdivide said disc into sections of smaller areal expanse capable of being separated into individual semiconductor device containing wafers;

thereafter subjecting the disc to a diffusion process to produce a sequence of at least three layer-type zones of different conductivity which form at least one pn-junction in each said section, and a zone of a single conductivity type which passes through the entire disc in the profile region of each of the grooves, said region defining the lateral boundaries of the pn-junctions;



in each said section and adjacent the associated groove, forming a closed recess in the major surface of the disc which is adjacent to the pn-junction which would be stressed in the reverse direction during use of the semiconductor device being produced, with said recess extending through the zone which is adjacent said major surface and forms a pn-junction with sai highly resistive zone and into said highly resistive zone;

subjecting at least the surfaces of said recesses to passivation by covering same with an insulating and stabilizing substance;

providing electrical contacts for the devices formed in said sections of said disc;

electrically testing the devices formed in said sections; and

thereafter separating said disc along said grooves into individual semiconductor wafers.

4,135,292

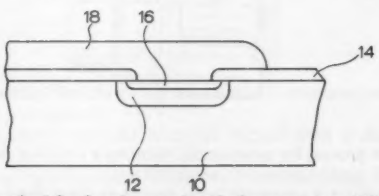
INTEGRATED CIRCUIT CONTACT AND METHOD FOR FABRICATING THE SAME

James M. Jaffe, Los Altos, and Jack I. Penton, Castro Valley, both of Calif., assignors to Intersil, Inc., Cupertino, Calif.

Filed Jul. 6, 1976, Ser. No. 702,576

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **2 Claims**



1. A method for forming an electrical contact to a diffusion region within a monocrystalline semiconductor layer comprising the steps of:

converting a selected upper portion of said diffusion region of said semiconductor layer into an amorphous form by implanting ions into said semiconductor layer, said ions having a predetermined minimum energy; and

disposing a metallic layer at least on said semiconductor layer in contact with said upper portion of said diffusion region having said amorphous form, wherein said mono-

crystalline semiconductor layer is a silicon substrate having a [100] crystallographic orientation;

wherein said diffusion region has an N type of conductivity;

wherein said ion implanted amorphous upper portion has said N type of conductivity;

wherein said implanted ions are arsenic ions implanted into said upper portion of said semiconductor layer with an energy of approximately 180 keV with an implantation dosage of approximately 10^{15} ions/cm^2; and

said metallic layer is of aluminum.

4,135,293

SUPERCONDUCTING MEMBERS AND METHODS OF MANUFACTURING THEREOF

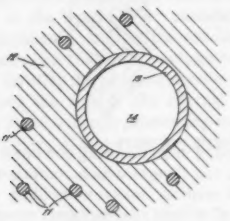
Peter E. Madsen; James A. Lee, both of Harwell, and Derek Armstrong, Wallingford, all of England, assignors to United Kingdom Atomic Energy Authority, London, United Kingdom

Filed Sep. 29, 1975, Ser. No. 617,640

Claims priority, application United Kingdom, Oct. 1, 1974, 42651/74

Int. Cl.[2] H01V *11/00*

U.S. Cl. 29—599 **9 Claims**



1. A method of manufacturing a superconducting member embodying a superconductor of A15 crystal structure having the general formula A_3B, where A comprises niobium or vanadium metal and B is one or more elements which when reacted with the metal A will form the said superconductor, which method comprises forming a composite material essentially consisting of a carrier material and one or more of the elements B, providing a plurality of discrete rods of a base material essentially consisting of the metal A within and in contact with the composite material, forming the composite material with the rods of base material therein and a metal, which is eventually to provide stabilisation, into a unitary structure in which a barrier layer of a metal A impermeable to the B element or elements is located as a diffusion barrier separating the stabilising metal from the composite material along the whole length of the unitary structure, and an additional barrier layer between the said barrier layer of metal A and the composite material, which additional barrier layer during subsequent heat treatment inhibits formation of superconducting A_3B compound over the whole or a substantial part of the surface of the diffusion barrier layer of metal A which, but for the additional barrier layer could be in contact with the composite material, reducing the unitary structure to wire form by a mechanical reduction process whereby the rods of base material become filaments in a matrix of composite material and the stabilising metal together with the barrier layer extend along the length of the wire, and heat treating the wire to cause reaction between the said filaments of base material and the B element or elements to form filaments of superconducting A_3B compound, whilst said additional barrier layer inhibits formation of superconducting A_3B compound over the whole or a substantial part of the said surface of the diffusion barrier layer, said carrier material comprising an element selected from the group consisting of copper, silver and gold, which element under said heat treatment neither reacts substantially with the base material nor undesirably influences reaction between the chosen B element or elements and the base material.

4,135,294

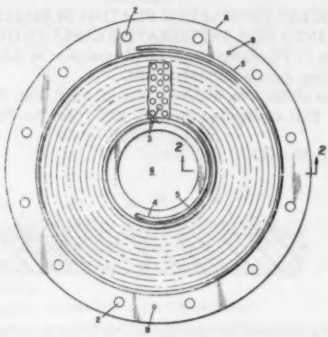
WINDING A MULTI-PANCAKE MAGNET FROM A CONTINUOUS CONDUCTOR

Robert L. Brown, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 24, 1978, Ser. No. 889,665

Int. Cl.[2] H01F *41/06*

U.S. Cl. 29—605 **6 Claims**



1. A method of making and winding a multi-pancake magnet from a continuous conductor comprising the steps of forming a large hole in a first set of plates for the coil bore of said magnet, sequentially machining one side of each of said plates with an inwardly, radially-spiraling groove extending in a clockwise direction from a point near the outer perimeter of each plate to a point near said bore, machining a short crossover slot through each of said plates at the two end points of each of said spiral grooves, forming a large hole in a second set of plates for said coil bore, sequentially machining one side of each of said second plates with an outwardly, radially-spiraling groove extending in a clockwise direction from a corresponding point near its bore to a point near its outer perimeter that corresponds to the beginning point of the groove of each of said first plates, machining a short crossover slot through each of said second plates at the two end points of each of said spiral grooves in said second plates, machining a conductor pass-through hole in a bottom cover plate for said magnet, machining a conductor pass-through hole in a top cover plate for said magnet, each of said first, second and cover plates fabricated from the group consisting essentially of metal, ceramic and a reinforced polycarbonate plastic, threading said conductor from a supply spool through said hole in said top cover plate, through the crossover slot near the bore of one of said second plates, through the crossover slot near the outer perimeter of one of said first plates, through the crossover slots of additional pairs of second and first plates in the same manner as the above second and first plates were threaded until a desired number of such pairs of plates are threaded on said conductor, and finally threading said conductor through said hole in said bottom cover plate, then bringing said bottom cover plate and one of said first plates to a horizontal, flat winding table and clamping them on the face thereof, slowly rotating said table while at the same time drawing said conductor from said supply spool and pressing said conductor into the spiral groove of said clamped first plate and after it is wound full of conductor, stopping said table rotation, bringing one of said second plates to said winding table and clamping it on top of said wound first plate, rotating said table again while at the same time continuing drawing said conductor from said supply spool and pressing said conductor into the spiral groove of said clamped second plate until it is wound full of said conductor, and repeating said winding steps for each of said desired number of pairs of first and second plates until they are wound with said conductor, bringing said top cover plate and placing it on top of the last wound plate, and finally bolting all of said plates together to

thus provide a finished magnet, said conductor passing through appropriate crossover slots in respective ones of said plates during said winding steps to provide said finished magnet with a continuous conductor without any splices.

4,135,295

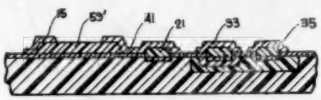
PROCESS OF MAKING PLATINUM SILICIDE FUSE LINKS FOR INTEGRATED CIRCUIT DEVICES

William L. Price, Saratoga, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 662,340, Mar. 1, 1976, Pat. No. 4,042,950. This application Jun. 20, 1977, Ser. No. 807,806

Int. Cl.[2] H01H *69/02*

U.S. Cl. 29—623 **2 Claims**



1. In a process for making fusing links in integrated circuit construction including the steps of providing a suitable substrate, forming circuit regions, the improvement comprising,

depositing a polycrystalline silicon layer over said substrate,

defining fuse geometry in said polycrystalline silicon layer by masking and etching,

depositing a platinum layer onto said fuse geometry,

thermally reacting said platinum with said polycrystalline silicon, thereby forming platinum silicide fuses, and

removing excess platinum.

4,135,296

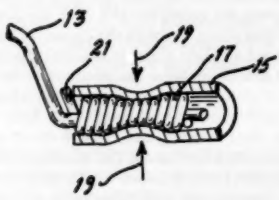
METHOD OF JOINING A FINE WIRE FILAMENT TO A CONNECTOR

Seiji Kami, Pacoima, and Warren A. Stefferson, Canoga Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 19, 1977, Ser. No. 826,106

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—628 **2 Claims**



1. The method of joining a fine wire filament to an open ended cylindrical connector comprising the steps of inserting a closely wound helical wire coil into the open end of the cylindrical connector, inserting the wire filament into said wound helical wire coil, and lightly crimping a limited area of the portion of said cylindrical connector having said wire coil therein to physically attach and electrically connect said wire filament to said cylindrical connector without any severe discontinuities and areas of stress concentration in said filament wire.

4,135,297

METHOD FOR THE PRODUCTION OF A COIL BODY WITH CONNECTING PINS INCORPORATED IN THE COURSE OF INJECTION

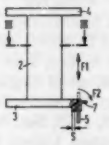
Peter Guttenberger, Munich, and Harry Schroeder, Unterhaching, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

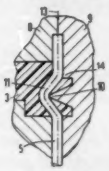
Filed Mar. 18, 1977, Ser. No. 779,099

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612582

Int. Cl.[2] H01H *49/00*

U.S. Cl. 29—629 **3 Claims**





1. The method of manufacturing coil cores having a winding tube with axial end flanges which comprises the step of: providing a multi-member injection-molding mold set having opposed faces of at least two members movable together into abutting contact at a parting line, the faces at least partially enclosing the space in which a core flange can be molded with providing a recess in the opposed face of a first one of the member forming a portion of the periphery of the flange space, providing means in at least one of the faces at the parting line for receiving and holding spaced portions of the contact pin on both sides of the flange space with the pins spanning the recess, providing a projecting striker in the recess on the first of the faces adjacent the means, the striker projecting toward the space from the periphery, parting the faces, inserting a pin in the means with a pin portion spanning the flange space and recess closing the faces and thereby gripping the pin between the faces, contacting the pin portion with the striker during closure, laterally bending the portion of the pin at least partially inwardly into the space during closing by contact with the striker terminating the bending with the bent portion lying entirely interior of the space, the striker projecting from a portion of the periphery of the space which defines a periphery of the flange therafter filling the space and recess with injection-molding material forming a core, the material surrounding at least portions of the bent pin and partially embedding the pin, including the bent portion within the material in a flange of the core with remaining portions of the pin projecting from the flange.

4,135,298

DEFORMABLE HEAT TRANSFER FIN

James A. Rew, Glen Burnie; Albert B. Simon, Ellicott City, and Thomas M. Fahey, Laurel, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

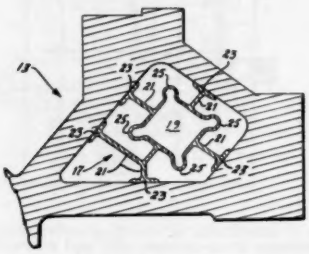
Filed Jun. 21, 1977, Ser. No. 808,493

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—727 **2 Claims**

1. In combination, an elongated extrusion member having a longitudinal internal cavity therein for passage of a cooling fluid therethrough and a deformable heat transfer fin slightly smaller in size than the internal cavity of said extrusion mem-

ber for installation therein and means for fixedly positioning said heat transfer fin in said internal cavity comprising a square inner chamber in the central portion of said heat transfer fin, said square inner chamber having rounded thin-walled corners, a plurality of legs extending outwardly from each side of said square inner chamber, a corresponding plurality of feet on the outward end of each of said legs and means for pressurizing



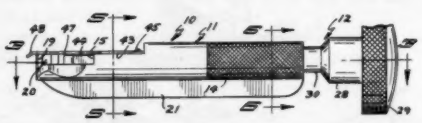
said square inner chamber whereby pressure of sufficient magnitude is applied to the square inner chamber of said heat transfer fin to permanently deform the rounded thin-walled corners of said square inner chamber leaving a residual stress in said heat transfer fin after the pressure is relieved causing the feet to press against the wall of the internal cavity of said extrusion member thereby fixedly positioning said heat transfer fin in the internal cavity of said extrusion member.

4,135,299

RING CUTTING TOOL

Maurice F. Moriarty, 7626 Marine Dr., Maple Grove, Minn. 55369

Filed Nov. 18, 1977, Ser. No. 852,671
Int. Cl.[2] B26B *17/04*
U.S. Cl. 30—182 **24 Claims**



1. A ring cutting tool to cut a ring segment of a ring lodged on a human finger in order to effect removal of the ring, said ring cutting tool comprising:

a tool housing;

an upright support located on the tool housing;

tool bit guide means located on the tool housing spaced from the support and defining with the support a work area in the space between the support and the guide means for accomodation of a ring segment to be cut;

a tool bit movably located in the guide means and movable into said work area toward the support;

means for movement of the tool bit;

cutting edge means secured between the tool bit and the support adaptable to cut a ring segment located in the work area between the tool bit and the support upon bearing pressure between the tool bit and the support upon movement of the tool bit toward the support; and

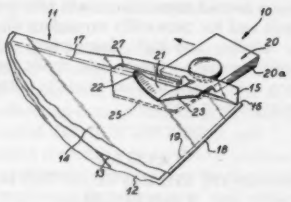
a finger shield mounted on the tool housing extending over the work area with a fixed end fixed to the housing and a free end, said free end insertable between the finger and a ring segment to be cut located in said work area to isolate the finger from the work area during the ring cutting procedure.

4,135,300

LAMINATION TRIMMING DEVICE

David D. Bradley, Mundelein, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Nov. 4, 1977, Ser. No. 848,735
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—293 **15 Claims**



1. A lamination trimming device for trimming excess laminating film along edges of a laminated product such that a border of sealed laminating film remains along the product edges, comprising:

(a) lower guide means having a top surface;

(b) upper guide means having a first portion adjacent to the lower guide means top surface and a second portion extending upwardly with respect to the top surface;

(c) cutting means above the first portion of said upper guide means for trimming off the excess film;

(d) said lower guide means including edge guide deflecting means for guiding the device along edges of the laminated product and for deflecting the excess laminated film to be trimmed into trimming contact with said cutting means; and,

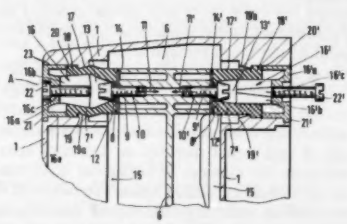
(e) means connecting and supporting the upper guide means above the lower guide means and supporting the cutting means above the first portion of the upper guide means.

4,135,301

MOTORIZED CHAIN SAW

Klaus Hoeppner, Marbach, Fed. Rep. of Germany, assignor to Firma Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,303
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623826
Int. Cl.[2] B27B *17/00*; F16F *1/36*
U.S. Cl. 30—381 **24 Claims**



1. A motorized chain saw, comprising a centrally located handle-housing member including at least one handle for carrying the saw; at least one crankcase member positioned laterally externally of said handle-housing member and having an aperture therethrough; and at least one means for providing a shock absorbing connection between the handle-housing member and the crankcase member, said connection means including a vibration-damping elastic member passing through said aperture, said elastic member including at least one centrally positioned axially extending expansion opening surrounded by

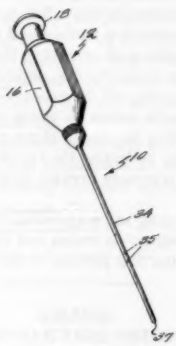
side walls of said elastic member which are laterally expandable against the inside surface of said aperture, said expansion opening being open on the end of said elastic member facing away from said handle-housing member and being generally closed to form an abutment end wall on the end facing said handle-housing member, said connection means further comprising a first fastening member insertable through said open end for fastening said abutment end to said handle-housing member, and a second expansion means selectively insertable into said open end for outwardly expanding the side walls of said elastic member into tight engagement with the inside surface of said aperture, whereby said elastic member may be replaced by a new elastic member from the outside of the saw without disassembling said saw.

4,135,302

ENDODONTIC THERAPEUTIC DEVICE AND PROCEDURES

Joseph H. Kronman, Canton, and Melvin Goldman, Worcester, both of Mass., assignors to National Patent Development Corporation, New York, N.Y.

Filed Feb. 28, 1975, Ser. No. 554,222
Int. Cl.[2] A61C *5/02*
U.S. Cl. 32—57 **2 Claims**



1. An endodontic therapeutic process utilizing an elongated tubular member having a longitudinal liquid-transporting bore therein, and a plurality of lateral orifices in a distal end thereof and a solid distal tip to prevent the passage of liquid therethrough, said process comprising the steps of

removing selected portions of dentin and pulp in a root-pulp channel,

inserting the distal tip of said tubular member into said root-pulp channel so that the lateral orifices of said member are short of the tooth periapical area,

exerting a mechanical action against the walls of the root-pulp channel by spraying a liquid through the lateral orifices in the distal end of said tubular member against the walls of the root-pulp channel while preventing the spraying of said liquid directly on the root apex to thereby minimize the chances of periapical involvement, and exerting a chemical action against the walls of the root-pulp channel by spraying said liquid laterally against walls thereof.

4,135,303

TOY SUCH AS A BOARD

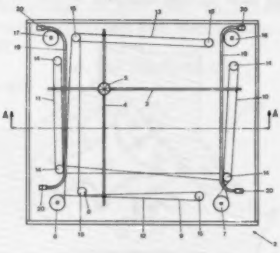
Bernard F. Gresset, Neuilly sur Seine, France, assignor to Jouets Educatifs Universels, Drancy, France

Filed Jul. 18, 1977, Ser. No. 816,348
Int. Cl.[2] B43L *13/00*
U.S. Cl. 33—18 R **6 Claims**

1. In a toy of the type having a box with a translucent screen coated with an opaque pulverulent powder wherein there is a tracing device making it possible to draw forms on the translucent screen by applying a stiletto carried by a plurality of rods on to said screen, the improvement wherein the box carries on its base at least two stirrups hinged about bearings,

screws each having means for accommodating a stirrup,

means including said means for accommodating for causing



said stirrups to co-operate with said screws in operating the lowering or raising of said stirrups to actuate one of the rods carrying the stiletto so as to move it away from the screen or bring it closer to same,

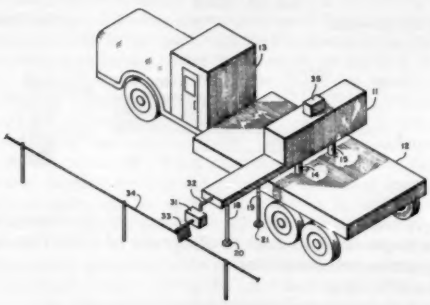
said screws being integral with operating studs distributed on the upper surface of said box.

4,135,304

PROFILE INDICATING SYSTEM FOR ROADWAYS

Leland E. Kuntz, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 11, 1975, Ser. No. 639,672
Int. Cl.[2] G01B *07/28*
U.S. Cl. 33—174 P **6 Claims**



1. An indicating system, to be moved along a roadway by a vehicle for indicating the profile of a finished or unfinished surface of the roadway, comprising:

elevation sensing means, adapted to be supported on a support means, including at least first and second grade sensing means for generating respective first and second electrical signals proportional to the elevation of at least respective first and second points along said surface;

grade and slope sensing and control means, responsive to predetermined grade and slope references, adapted to maintain said support means stabilized in grade and slope axes; and,

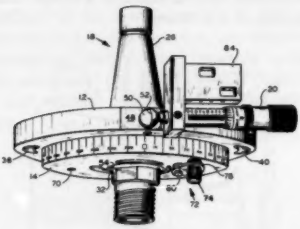
indication means responsive to said first and second electrical signals for providing corresponding first and second proportional indications of said respective first and second points along said surface to indicate the profile of said surface.

4,135,305

INDEXING DEVICE

Raymond Krause, 6815 Hollywood Dr., Parma, Ohio 44129

Filed Sep. 13, 1977, Ser. No. 832,944
Int. Cl.[2] G01B *5/00*
U.S. Cl. 33—174 TD **5 Claims**



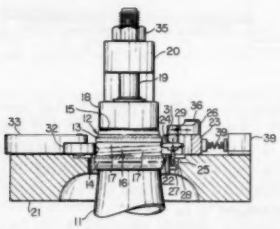
1. A rotary sine indexing device for attachment to a spindle comprising:
- a base having an aperture formed therein;
- a disc having an annular opening and an annular array of apertures formed about said annular opening;
- means for securing said disc to said base whereby the aperture is said base and the opening in said disc are aligned, and permitting limited relative movement between said disc and said base about the center axes of the aperture in said base and the opening in said disc;
- a spindle extension having an extended body portion and a radially outwardly flaring flange portion, said flange portion receivable within the annular opening of said disc;
- a plate having an opening therein and at least two arcuate slots spaced about the opening;
- fastener means extending through the slots in said plate for securing said plate to said spindle extension;
- positioning means associated with said plate and adapted to align with selective ones of the apertures of the annular array in said disc whereupon coarse adjustment may be made by releasing said positioning means and effecting relative movement between said plate and said disc to rotate said spindle extension; and
- micrometer means for effecting fine adjustment of said disc, plate and spindle extension relative to said base.

4,135,306

CLOSURE TESTING MEANS AND METHOD

Charles N. Hannon, 27 Sargent Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 626,369, Oct. 28, 1975, abandoned. This application Sep. 17, 1976, Ser. No. 724,245
Int. Cl.[2] B07C *1/10*; G01B *7/26*
U.S. Cl. 33—199 B **15 Claims**



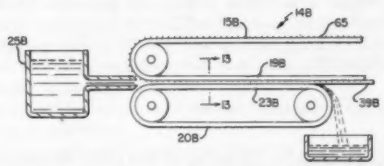
1. Apparatus for testing closures on containers, said closures comprising a thin-walled cylindrical portion deformed over a predetermined axial region by external pressure to form a threaded section comprising an outer surface with outwardly extending parts and a valley therebetween in conformity with a threaded part of the neck of the container, said apparatus comprising:
- a first feeler means comprising a surface portion to engage said outwardly extending parts of said outer surface of said threaded section, said surface portion being too wide to fit into said valley;
- a second feeler means shaped to fit into said valley of said outer surface;
- means to bring said closure into contact with said first and second feeler means;
- means to rotate said container and closure;
- supporting means to support one of said feeler means for relative movement with respect to the other of said feeler means in a direction substantially perpendicular to the axis of said threaded section of said closure; and
- transducer means responsive to a relative position between said first and second feeler means in the direction substantially perpendicular to said axis of said closure corresponding to a predetermined radial difference between said outwardly extending portion of said external thread and the deepest part of said valley of said external thread to indicate when said relative position corresponds to a certain thread depth.

4,135,307

METHOD AND APPARATUS FOR REMOVING LIQUID FROM LIQUID BEARING MATERIAL

James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Division of Ser. No. 695,092, Jun. 11, 1976, Pat. No. 4,050,162, which is a continuation-in-part of Ser. No. 541,218, Jan. 15, 1975, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449. This application Jun. 24, 1977, Ser. No. 809,945
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.[2] F26B *3/34*
U.S. Cl. 34—1 **28 Claims**



1. In a method of forming a layer of material by moving retained liquid in liquid bearing material of the liquid absorbing type by electrostatic action, the improvement comprising the step of disposing a plurality of needle-like projections at least partially through said material to assist said electrostatic action in moving retained liquid in said material during the forming of said layer from said material.

4,135,308

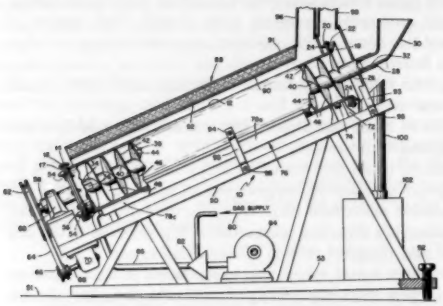
CONTINUOUS GRAIN DRYING METHOD

John O. Benson, Rte. 1, Box 28, Mayer, Minn. 55360

Division of Ser. No. 673,934, Apr. 5, 1976, Pat. No. 4,038,021. This application Apr. 25, 1977, Ser. No. 790,541
Int. Cl.[2] F26B *3/00*
U.S. Cl. 34—9 **6 Claims**

1. A method of continuous drying including the steps of introducing a granular product to be dried to the lower end of an inclined auger having at least some helical flights containing perforations smaller than the grains constituting said product, rotating said auger within a tubular metal casing engaging the outer edges of said flights at a rate such that said granular product and a quantity of heat-conductive particles substantially fill the space between a number of said flights, said heat-

conductive particles being of a size smaller than said perforations, and heating the outside of said casing so that heat is



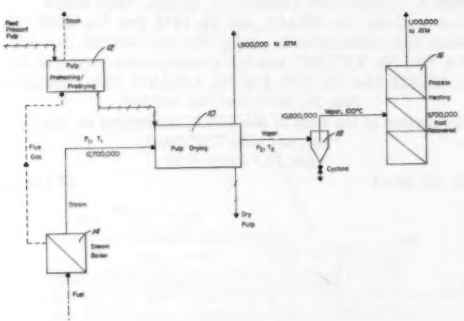
transferred therethrough to said product and heat-conductive particles.

4,135,309

PROCESS FOR DRYING BEET PULP

Milovan Bosnjak, Denver, Colo., assignor to Buttes Gas & Oil Co., Oakland, Calif.

Filed Jul. 11, 1977, Ser. No. 814,497
Int. Cl.[2] F26B *5/14, 7/00*
U.S. Cl. 34—14 **7 Claims**



1. In a process for the drying of beet pulp following removal of the sugar therefrom wherein the pulp is first pressed to squeeze out a portion of the water and then dried, the improvement which comprises drying the pulp in heat exchange relation with heating medium to vaporize a substantial proportion of the remaining water while keeping the vapors thus produced and said heating medium isolated from one another, separating the vapors from any dust entrained therein and stripping the heat from the dust-free vapor.

4,135,310

APPARATUS FOR THE TREATMENT OF WEBS OF MATERIAL

Heinrich Führing, Augsburg, and Winfried Steitz, Friedberg, both of Germany, assignors to Böwe Böhler & Weber KG, Augsburg, Germany

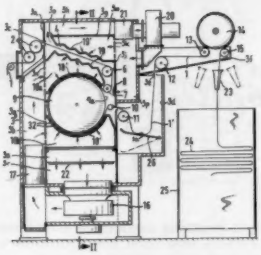
Filed Apr. 7, 1977, Ser. No. 785,692
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615261
Int. Cl.[2] F26B *13/08, 13/12, 13/20*
U.S. Cl. 34—52 **18 Claims**

1. An apparatus for the treatment of a web of material with a fluid, comprises:

a housing;

a drum having a cylindrically perforated periphery rotatable in said housing about a horizontal axis;

fluid-cushion means defining a substantially linear guide path for said web disposed above said drum in said housing and inclined toward said drum in a direction of advance of said web thereto, said fluid-cushion means including a pair of spaced-apart perforated wall defining between them a channel having an inlet at an upper location at one side of said drum, a linear stretch above said drum constituting said guide path, and an outlet at a lower location at the opposite side of said drum;



guide means between said outlet and said opposite side of said drum for depositing said web from said fluid-cushion means upon said periphery of said drum; and

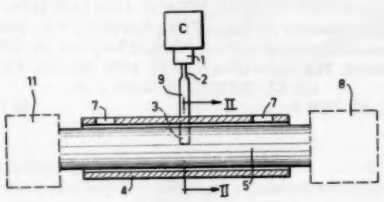
means in said housing for feeding a treating fluid to said fluid-cushion means for supporting said web along said path on a cushion of said fluid and for feeding said fluid generally radially through said web on said periphery of said drum.

4,135,311

DEVICE FOR DRYING WRAPPED ROD-SHAPED PRODUCTS, IN PARTICULAR CIGARS

Pierre L. Imbert, Fleury-les-Aubrais, France, assignor to Service d'Exploitation Industrielle des Tabacs et des Allumettes, Paris, France

Continuation of Ser. No. 504,331, Sep. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 373,194, Jun. 25, 1973, abandoned, which is a continuation of Ser. No. 134,326, Apr. 15, 1971, abandoned. This application Sep. 23, 1977, Ser. No. 836,059
Claims priority, application France, Apr. 16, 1970, 70.13764
Int. Cl.[2] F26B *17/00*
U.S. Cl. 34—57 E **3 Claims**



1. A device for rapidly drying a humid envelope, in which a rod-shaped tobacco product is enclosed without substantial drying of said product, said device comprising

(a) means operable to provide a source of air having a relative humidity lower than the air previously surrounding the envelope to be dried;

(b) an annular drying chamber having at least one constricted portion with an inside section slightly greater than the outside section of said envelope and its enclosed product;

(c) means for rapidly conveying the envelope and its enclosed product coaxially through said chamber; and

(d) means for drying said product, including at least one air

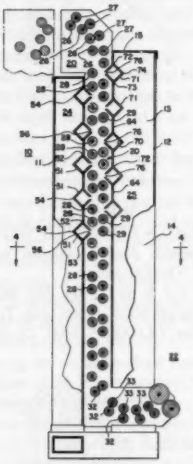
inlet disposed in the median portion of said chamber communicating with said air source and operable to admit air tangentially into said chamber from said air inlet for direct circulation about the outside surface of said envelope in said drying chamber, and at least one air outlet disposed at one end portion of said chamber and operable to permit escape of said circulating air after passage through the zone defined by the outside surface of said envelope and the inside of said drying chamber, said circulating air and said constricted portion being operable cooperatively to support and center the product by a cushion of air between said product and said constricted portion of said chamber.

4,135,312

FILM DRYER

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Apr. 21, 1977, Ser. No. 789,642
Int. Cl.[2] G03D *15/02*; F26B *13/00*
U.S. Cl. 34—160 **8 Claims**



1. An air dryer for sheet material and the like comprising

a housing,

a feeding section within said housing for advancing sheet material therein and having spaced rolls on each side of said sheet material,

air delivery sections on each side of said feeding section for delivering air against opposite faces of advancing material,

said air delivery sections including spaced air delivery ducts,

means for supplying air under pressure to said ducts, and

air delivery tubes contiguous to the opposite faces of the sheet material connected at their ends to said air delivery ducts for directly delivering air against said opposite faces of said advancing sheet material.

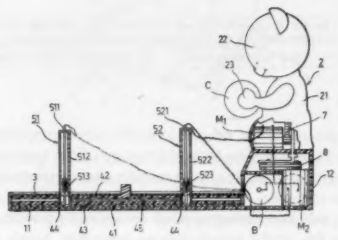
each of said air delivery tubes having wall portions with inlet openings communicating with said air delivery ducts and having converging wall portions terminating at an air delivery slot disposed inwardly between a pair of rolls in closely spaced relation to and facing said sheet material and directing air substantially normal to the direction of movement of the sheet material.

4,135,313

EDUCATIONAL TOY WITH ACTION

Hsing-Ching Liu, and Lan-dih Liu, both of 3F, No. 213, Chung Ching N.Rd. Sec. 4, Taipei, Taiwan

Filed Aug. 8, 1977, Ser. No. 822,450
Int. Cl.[2] G09B *7/10*
U.S. Cl. 35—9 C **2 Claims**



1. An educational toy comprising:

a base comprising a quiz device base portion and a statue base portion:

an active statue mounted on said statue base portion, said statue having a movable head portion and two resilient arms;

a pair of operating rods;

a first actuating mechanism including a first drive motor connected to said head portion and to said resilient arms for producing a nodding motion of said head portion and a clapping motion of said arms upon activation of said first drive motor;

a second actuating mechanism including a second drive motor connected to said head portion for producing a a wagging motion of said head portion upon activation of said second drive motor; said rods being electrically connected to said mechanisms;

an electrical power source connected to said first and second actuating mechanisms;

a series of replaceable question-and-answer plates selectively mountable over said quiz device base portion, each plate having a plurality of indicia thereon each representing a question and a plurality of related indicia each representing an answer, and every indicia has a corresponding punched hole;

a quiz device arranged under said question-and-answer plate comprising an electrical conductive bottom layer, a non-conductive marking layer, and an intermediate circuit layer sandwiched therebetween, a plurality of top opened holes formed extending through said device to said bottom layer, said holes being distributed and positioned corresponding to the punched holes of said question-and-answer plate, a circuit being connected between holes corresponding to said question indicia and holes corresponding to said answer indicia, such that when one of said operating rods is inserted into a hole to indicate a question and the other rod is inserted into the wrong hole to give an incorrect answer, the second actuating mechanism is activated to cause said head portion to wag to-and fro, and when said other rod is inserted into the right hole to give a correct answer, then in addition to said second actuating mechanism said first actuating mechanism is also activited to cause said head portion to nod and said arms to clap to such extent that it dominates over said wagging motion caused by said second actuating mechanism.

4,135,314

PRE-RECORDED MAGNETIC AUDIO TAPE FOR STUDY

Takeshi Yamamoto, Fujinodai-Dsnchi 1-20-106, Honmachida 3486, Machida-shi, Tokyo, Japan

Filed Sep. 27, 1977, Ser. No. 837,353

Claims priority, application Japan, Mar. 22, 1977, 52-33384[U]

Int. Cl.[2] G09B 5/04

U.S. Cl. 35—8 A 4 Claims

1. A pre-recorded magnetic audio tape comprising at least two tracks in one direction of advance of the tape and adapted to use with a tape recorder which can reproduce recorded sound in one track and the other track selectively or simultaneously, said tape being applied for recording with sound of a sentence for study which has at least two blank parts each constituting a question for an expected answer, wherein one track of said tape is recorded with the sound of said sentence except for said one blank part of said sentence and the other track of said tape is recorded with the sound of said sentence except for the other blank part of said sentence, the same sound of said sentence recorded on all of the tracks coinciding with each other to be reproduced as a single sound when these tracks are scaned at the same time by magnetic reproducing head or heads of the tape recorder.

4,135,315

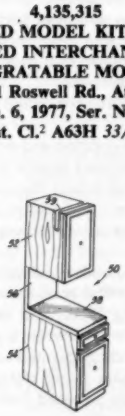
MINIATURIZED MODEL KITCHEN HAVING COORDINATED INTERCHANGEABLE AND INTEGRATABLE MODULES

Harry A. McKee, 6851 Roswell Rd., Atlanta, Ga. 30328

Filed Jan. 6, 1977, Ser. No. 757,398

Int. Cl.[2] A63H 33/06

U.S. Cl. 35—16 11 Claims



1. A module for a miniaturized model kitchen comprising a lower body formed to represent a lower cabinet, an upper body formed to represent an upper cabinet positioned over the lower body, a support panel extending vertically between said lower body and said upper body and rigidly supporting said upper body spaced over said lower body, and an open ended slot formed in the upper surface of said upper body for receiving a miniature valance strip, and cabinet identification markings on the upper surface of said upper body which indicate the style and size of both the lower and upper cabinets represented by the lower body and the upper body.

4,135,316

TAPE CASSETTES HAVING INDICATIONS FOR BLIND USE

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

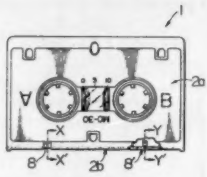
Division of Ser. No. 702,583, Jul. 6, 1976, Pat. No. 4,063,370.

This application Sep. 19, 1977, Ser. No. 834,564

Claims priority, application Japan, Jul. 9, 1975, 50-95926; Jul. 14, 1975, 50-96731

Int. Cl.[2] G09B 21/00

U.S. Cl. 35—35 A 10 Claims



1. A tape cassette having at least one finger readable marking, comprising:

a cassette housing formed by front and rear cassette members (2, 3);

a finger readable recess (8) formed in the periphery of one of said front and rear members, said recess being formed of a transparent material and being indicative of the location of the front and rear surface of said cassette; and

visual indicia (9a) formed on the inner surface of said transparent material at the location of said recess such that said visual indicia may be viewed from the exterior of said cassette, said visual indicia being indicative of the location of said front and rear surface of said cassette.

4,135,317

SPORTS SHOES EQUIPPED WITH CLEATS

Eizo Ikeda, Amagasaki, Japan, assignor to Mizuno Sporting Goods, Co., Ltd., Osaka, Japan

Filed Jul. 6, 1977, Ser. No. 813,327

Claims priority, application Japan, Jul. 7, 1976, 51-91015[U]

Int. Cl.[2] A43B 5/00, 23/28

U.S. Cl. 36—134 1 Claim

1. Sports shoes equipped with cleats secured to the sole thereof by screws and the like, which comprises the following disposition of said cleats:

a cleat 1 at the end of the distal phalanx of the first toe;

a cleat 2 at the joint connecting the distal phalanx of the first toe to the proximal phalanx thereof;

a cleat 3 at the joint connecting the proximal phalanx of the first toe to the metatarsus thereof;

a cleat 4 at the joint connecting the proximal phalanx of the fifth toe to the metatarsus thereof;

a cleat 5 at the joint connecting the middle phalanx of the fifth toe to the proximal phalanx thereof;

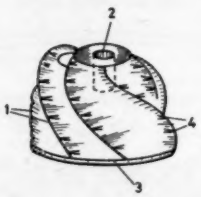
a cleat 6 substantially at the joint connecting the distal phalanx of the third toe to the middle phalanx thereof;
a cleat 7 at a position near the capital of the proximal phalanx of the second toe;
a cleat 8 under the talus near the navicular bone and away from the sustentaculum tali;
a cleat 9 at a position under the forward of portion the heel bone; and
cleats 10 and 11 at positions adjacent the right and left sides of the rearward end of the tuber calcanei respectively.

4,135,318

TOOTH POSITIONING ARRANGEMENT FOR AN UNDERWATER SOIL CUTTING HEAD

Johan H. Volbeda, Rijswijk, Netherlands, assignor to Hollandsche Aanneming Maatschappij B.V., Rijswiji, Netherlands

Filed Jun. 28, 1976, Ser. No. 700,367
Claims priority, application United Kingdom, Mar. 19, 1976, 11283/76
Int. Cl.² E02F *3/88*
U.S. Cl. 37—67 **3 Claims**



1. In a cutting head construction for cutter suction dredgers used for the underwater cutting of rocks, earth, ores or the like, said cutting head being of generally conical shape and comprising a plurality of heiical cutting arms fixed at their one ends to a hub and at their other ends to a base ring, a plurality of cutting teeth being mounted on each cutting arm, the improvement comprising the teeth of the cutting arms being positioned in a multi-staggered arrangement, the distance a/n over which the teeth of a cutter arm are staggered with respect to the teeth of adjacent cutter arms being defined by: $a/2 - b \cos \alpha°$, where a is the tooth spacing on an individual cutter arm, n is the number of subdivisions of the tooth spacing, b is the spacing of contourlines in the direction of the swinging movement of the cutter head in operation, and $\alpha°$ is the approximate slope angle of a contourline, a contourline being defined by a curved line through the points of intersection of the toothtips with a plane extending through the rotational axis of the cutter head.

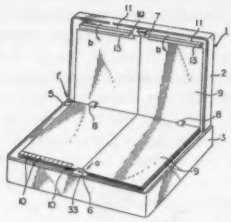
4,135,319

INDEXING DEVICE

Chuzo Mori, Tateishi, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1976, Ser. No. 752,995
Claims priority, application Japan, Dec. 23, 1975, 50-153557
Int. Cl.² B42F *17/34*
U.S. Cl. 40—389 **16 Claims**

1. An indexing device comprising:
(a) a base member;
(b) a cover member pivotally secured to the base member;
(c) a plurality of cards filed between the base member and the cover member, each card having a protrusion on an edge of the card, the protrusions on the plurality of cards each being at least in part exposed with respect to each other;
(d) a plurality of selector arms, mounted inside the cover member in correspondence to the exposed portions of the protrusions and operable through the cover member for selecting a desired card by downwardly depressing the protrusion of the desired card to form a gap between the desired card and the card immediately thereabove; and
(e) a card-retaining means mounted inside the cover member



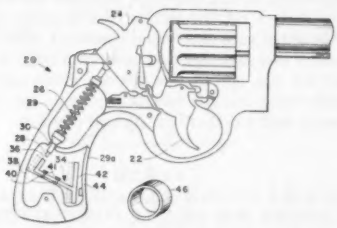
for retaining the cards situated between the desired card and the cover member by engaging the card immediately above the desired card upon depression of a selector arm, the same being facilitated by the presence of the gap.

4,135,320

MAGNETICALLY ACTUABLE SAFETY APPARATUS

Joseph E. Smith, 170 Locksunart, Apt. 23, Sunnyvale, Calif. 94087

Filed Mar. 24, 1977, Ser. No. 781,033
Int. Cl.² F41C *17/08*
U.S. Cl. 42—70 R **37 Claims**



1. A safety apparatus for selectively blocking movement of a part of a weapon employing said apparatus comprising:
a magnetically actuable member slidably mounted with respect to said part;
stop means for preventing said member from sliding beyond a preferred distance;
biasing means juxtaposed said magnetically actuable member for maintaining said member in a blocking relationship with movement of said part; and
magnetic means from without said weapon for overcoming said biasing means, so as to slide said member out of the blocking relationship with said part so that said part is free to move.

4,135,321

FIRING NIPPLE

Michael Lewallyn, P.O. Box 1361, Dalton, Ga. 30720

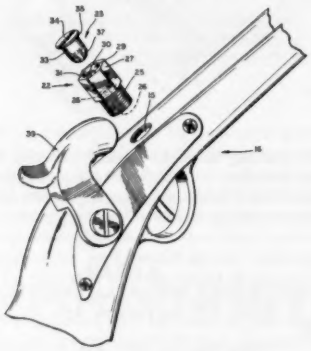
Filed Mar. 27, 1978, Ser. No. 890,383
Int. Cl.² F41C *27/00*
U.S. Cl. 42—83 **2 Claims**

1. A generally bolt-shaped firing nipple for use with a rimmed, cylindrical, cartridge-shaped powder-bearing percussion cap in muzzle loading firearms, said nipple comprising:
a cap cradling portion, said cradling portion including a duct defined axially therethrough having an internal diameter sufficient to accept the outside diameter of said cylindrical body of said percussion cap within said duct;
an externally threaded portion being an extension of said cap cradling portion for insertion into the breech of a muzzle

loading gun, said threaded portion including an open-ended vent passage extending axially therethrough, said vent passage having an inside diameter substantially smaller than the diameter of said duct;

said cap cradling portion including at its end opposite to said externally threaded portion an annular upper edge against which the rim of said cartridge shaped percussion cap rests;

a firing ridge formed on said upper edge;



whereby a cartridge-shaped percussion cap is inserted into said cradling portion of said nipple with the rim of said cap resting on said flat upper edge and said cap rim being held slightly off one section of said upper edge by said firing ridge such that when contact is made against the back of said cartridge cap, said firing ridge is driven into said cap rim, igniting the powder within said cap which sends flame through said vent passage into the powder load of said gun thus igniting said powder.

4,135,322

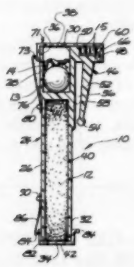
MUZZLE CHARGE STORAGE AND LOADING ACCESSORY FOR MUZZLE LOADING FIRE ARMS

Richard P. Tice, 3211 N. Nelson, Spokane, Wash. 99206, and Donald L. Galbraith, 6205 N. Nevada, Spokane, Wash. 99207

Filed Jan. 9, 1978, Ser. No. 867,670

Int. Cl.[2] F42B *39/04*; F41C *27/00*

U.S. Cl. 42—90 **5 Claims**



1. A muzzle charge storage and loading accessory for storing and facilitating the loading of a preselected charge of gunpowder, ball and percussion cap into a muzzle loading fire arm comprising:

a housing having (1) an elongated cylindrical section with an upper portion and a lower portion, and (2) a clip section formed integrally with the upper section and having an arm means extending outward and downward alongside the upper portion forming a slot therebetween to receive a belt or pocket or the like therein to enable the housing to be easily attached and removed from the belt or pocket or the like;

wherein the lower portion of the cylindrical section includes an axially extending powder cavity formed therein having an opening at a lower end of the cylindrical section for receiving a preselected amount of gunpowder;

wherein the upper portion of the cylindrical section includes an axially extending ball cavity formed therein having an opening at an upper end of the cylindrical section for receiving a ball;

wherein said housing includes a percussion cap cavity formed therein for receiving at least one percussion cap; and

enclosure means for selectively enclosing the powder cavity, the ball cavity, and the cap cavity to protect the powder, ball and percussion cap from contamination during storage.

4,135,323

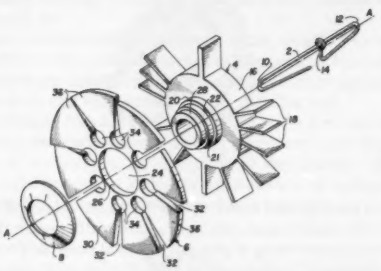
SONIC FISHING LURE

Harold Esten, 73 Messenger La., Willingboro, N.J. 08046

Filed May 13, 1977, Ser. No. 796,907

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.16 **10 Claims**



1. A sonic fishing lure movable through the water in a path coincident to its longitudinal axis, comprising,

attachment means connectible by a fishing line so that movement of the fishing line will draw the lure forwardly in the water,

a rotary member provided with blades which have surfaces lying at an acute angle to said longitudinal axis, said rotary member supported for rotational movement about said longitudinal axis in response to movement of the lure through the water,

a second member lying adjacent to said rotary member, said second member having obstructions lying in the path of water moving between said blades, said obstructions being discontinuous in directions circumferential to said longitudinal axis so as to present a varying impediment to water flowing between the blades to generate sonic waves in the water, one said member having an external bearing surface lying concentric with said axis, and the other member having an internal bearing surface riding on said external bearing surface.

4,135,324

ILLUMINATED DISC AIRFOIL TOY

Ronald L. Miller, 5959 Post Rd., and Henry A. Murray, II, 605 Kendal Rd., both of Nashville, Tenn. 37205

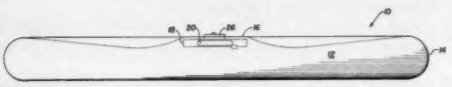
Filed Apr. 4, 1977, Ser. No. 783,842

Int. Cl.[2] A63H *27/00*

U.S. Cl. 46—74 D **4 Claims**

1. An aerial toy adapted to be rotatably thrown and caught by hand comprising a gull wing shaped, crazed transparent disc; said disc having an arcuate peripheral edge and an integral upper surface sloping inwardly and downwardly from said edge and finally upwardly to a closely adjacent thickened

central body portion to constitute a gull wing air foil of enhanced lift characteristics to afford a maximum flight range path for the toy; the upper surface of said peripheral edge and



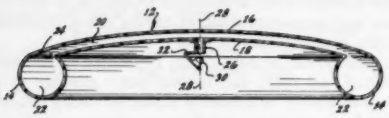
of said central body portion lying in the same horizontal plane; said crazed transparent disc when illuminated, comprising a circular optic fiber to indicate the angle of attack.

4,135,325

INFLATABLE FLYING SAUCER TOY

James A. Lehman, El Cajon, Calif., assignor to Warner-Lehman Corporation, El Cajon, Calif.

Filed Sep. 6, 1977, Ser. No. 830,632
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—74 D **8 Claims**



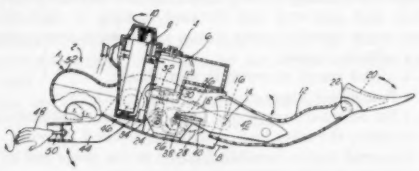
1. An inflatable flying saucer toy comprising:
a saucer like body having a peripheral lip, said lip depending from and positioned substantially below said body, said body and lip being joined and forming a single cavity the outer surfaces of which define the toy when inflated, a neck member sealedly attached to said body and open to said cavity and a stopper member for inserting into said neck for forming a pressure seal therewith, said flying saucer toy having sufficient rigidity when inflated for use as a toss toy and sufficiently limp when deflated for its complete deformation for storing in a small area.

4,135,326

AQUATIC FIGURE TOY

Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong

Filed Jan. 6, 1977, Ser. No. 757,252
Claims priority, application United Kingdom, Nov. 18, 1976, 48155/76
Int. Cl.[2] A63H *23/10*
U.S. Cl. 46—92 **3 Claims**



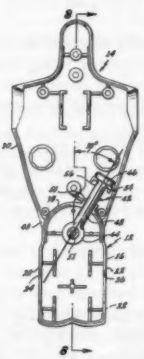
1. A floatable toy simulating a human swimmer for placement in and propulsion through water comprising: a hollow body including a head portion and a trunk portion and defining therein an interior chamber, the body including a water inlet opening adjacent the head portion, the body being further open at an end thereof remote from the head portion to define a water outlet; a watertight housing secured to the body and defining within itself a watertight compartment; motor means disposed within the compartment and including a drive shaft extending through an aperture in the housing into the chamber; arms pivotally attached to the trunk portion proximate the head portion; hollow legs having a first open end extending into the outlet defined by the trunk portion and means for pivotally attaching the legs to the trunk portion so that the legs can oscillate about a pivot axis; a crank arm secured to each leg and protruding through the open end thereof into the chamber, the crank arm defining an elongated slot disposed within the chamber; means mounting a crank shaft for rotation about an axis parallel to the pivot axis of the leg, the crank shaft mounting means being disposed within the chamber and positioning the crank shaft so that it engages the slot; and gear means operatively coupled to the drive shaft and the crank shaft mounting means for rotating the latter; whereby the energization of the motor means in the compartment causes a corresponding rotation of the drive shaft which is transmitted by the gear means to the crank shaft to cause the oscillation of the legs so that the oscillation of the legs causes the toy to be propelled in the direction of the head portion when placed in the water while water is permitted to enter the body chamber through the water inlet and to exit therefrom through the outlet to reduce the water resistance of the toy and to thereby reduce the energy consumption of the motor means.

4,135,327

DOLL CONSTRUCTION WITH PIVOTABLE TORSO MEMBERS

Jurgis Sapkus, Manhattan Beach, and J. Stephen Lewis, Pacific Palisades, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 1, 1977, Ser. No. 812,121
Int. Cl.[2] A63H *3/20*
U.S. Cl. 46—161 **6 Claims**



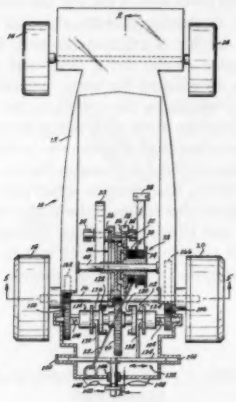
1. A doll construction comprising:
upper torso means having a midriff portion;
lower torso means having a midriff portion;
a ball-shaped surface on the midriff portion of said lower torso means, said surface having an integrally formed bushing portion with an aperture extending therethrough, said aperture being angularly displaced with respect to the longitudinal center line of said lower torso means;
socket means at the midriff portion of said upper torso means for matingly coacting with said ball means;
a generally flexible connector member having one end fixedly secured within said lower torso means and the other end rotatably secured within said upper torso means through said aperture said bushing portion generally broadly supporting said connector member, said connector member maintaining said upper and lower torso means in tension for relative pivotal movement with respect to each other on an axis extending through the center of said aperture.

4,135,328

CLUTCH MECHANISM FOR A TOY VEHICLE

Toshio Yamasaki, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 21, 1977, Ser. No. 761,496
Int. Cl.[2] A63H *29/20*
U.S. Cl. 46—202 **6 Claims**



1. In a toy vehicle having at least one drive wheel, the combination comprising:

a flywheel rotatably mounted within said vehicle;

an axle supported within said vehicle;

a drive gear rotatably mounted on said axle and coupled to said flywheel, said drive gear having lug means on a side surface thereof;

a drive member rotatably mounted on said axle adjacent said surface, said drive member being spring-biased in a first direction of rotation and having drawstring means coupled thereto for rotating said drive member in an opposite direction of rotation;

clutch means coupled to said drive member, the coupling being such as to permit rotation of said clutch means relative to said drive member through a limited angle and concurrent rotation with said drive member beyond said limited angle;

other means operatively coupled to said drive member and said clutch means and being responsive to relative motion in a first direction between said clutch means and said drive member for engaging said lug means to rotate said drive gear in said first direction of rotation, said other means being responsive to relative motion between said clutch means and said drive member in the opposite direction for disengaging said other means from said drive gear; and

gear means coupling said drive gear to said drive wheel.

4,135,329

VEHICLE WITH SPRING MOTOR OPERABLE IN RUNNING AND REWIND MODES

Melvin Kennedy, Hampton Bays, N.Y., assignor to Nagel/-Kennedy & Associates

Filed Sep. 29, 1977, Ser. No. 837,908
Int. Cl.[2] A63H *29/24*; F03G *1/00*
U.S. Cl. 46—206 **13 Claims**

1. A spring motor operable in a running mode and in a rewind mode without any change in its physical configuration comprising:

a. a motor frame;

b. a first motor member;

c. a flat coiled spring wound in a spiral about said first motor member, the inner end of which is secured thereto;

d. a second motor member secured to the outer end of said spirally wound spring;

e. means mounting said first and second motor members in said frame in a fixed coaxial relationship and for relative rotational movement therebetween;

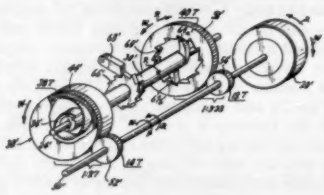
f. a shaft mounted in said frame for rotational movement in fixed parallel relationship to the axis of said second motor member;

g. rotational motion transmitting means interconnecting said shaft and said second motor member for rotating said shaft at a higher rotational speed than the rotational speed of said second motor member;

h. rotational motion transmitting and lost motion means interconnecting said shaft and said first motor member for rotating said first motor member in response to rotation of said shaft when said spring motor is operated in the running mode, said rotational motion transmitting and lost motor member turning said first motion means at a rotational speed less than the rotational speed of said second motor member, said lost motion means effectively disconnecting said shaft and said first motor member when said motor is operated in its rewind mode;

i. rewind ratchet means preventing rotation of said first motor member in the direction of unwinding of said spiral spring and permitting rotation thereof in the direction of winding said spiral spring; and

j. rotational power take-off means connected to said motor at one of said shaft, said second motor member or said rotational motion transmitting means for taking rotational power from said motor and for transmitting rewind movement thereto;



rotation of said power take-off means in a direction opposite to the normal running direction causing a rewinding of said spiral spring at a rate several times faster than said spring unwinds when said power take-off means rotates in the normal running direction.

9. A miniature toy vehicle having at least one driving wheel and a spring motor, said motor operable, without any change in its configuration, in both a running mode for driving said driving wheel in a forward direction and in a rewind mode in which reciprocating rearward and forward movement of said vehicle and rearward and forward turning of said driving wheel winds up said spring motor, said vehicle comprising:

a. a vehicle chassis;

b. a motor frame mounted in said chassis;

c. a first motor member;

d. a flat coiled spring wound in a spiral about said first motor member the inner end of which is secured thereto;

e. a second motor member secured to the outer end of said spirally wound spring;

f. means mounting said first and second motor members in said frames in a fixed coaxial relationship and for rotational movement therebetween;

g. a drive shaft mounted in said frame for rotational movement in fixed parallel relationship to the axis of said second motor member;

h. rotational motion transmitting means interconnecting said drive shaft and said second motor member for rotating said drive shaft at a higher rotational speed than the rotational speed of said second motor member;

i. rotational motion transmitting and lost motion means interconnecting said drive shaft and said first motor mem-

ber for rotating said first motor member in response to rotation of said drive shaft when said spring motor is operated in the running mode, said rotational motion transmitting and lost motion means turning said first motor member at a rotational speed less than the rotational speed of said second motor member, said lost motion means effectively disconnecting said drive shaft and said first motor member when said motor is operated in its rewind mode;

j. rewind ratchet member preventing rotation of said first motor means in the direction of unwinding of said spiral spring and permitting rotation thereof in the direction of winding said spiral spring; and

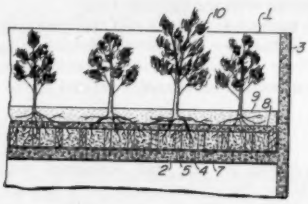
k. said driving wheel of said vehicle connected to said drive shaft; rotation of said driving wheel in the rearward direction causing rewinding of said spiral spring at a rate several times faster than said spiral spring unwinds when said driving wheel is rotated in the forward direction.

4,135,330

ROOF-GARDEN

Masahiko Aoyama, 12, Kakuozandori-6-chome, Chikusa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Oct. 13, 1977, Ser. No. 841,949
Claims priority, application Japan, Feb. 14, 1977, 52-14822
Int. Cl.[2] A01G *9/00*
U.S. Cl. 47—1 R **5 Claims**



1. A roof-garden comprising:

a sheet of vinyl spread on a slabbed floor of a roof of a building and extending along inner surfaces of walls of the building up to a certain level above the slabbed floor;

a plurality of wooden blocks arranged in a plurality of suitably spaced-apart rows on the vinyl sheet covered floor in such a manner that the wooden blocks of the two adjacent rows are arranged in staggered relationship and wooden blocks of each row are spaced apart from one another for a suitable distance;

a first earth layer formed in a space containing the wooden blocks;

an upper concrete layer provided on said first earth layer;

a second earth layer formed on said upper concrete layer; and

trees and shrubs planted in said second earth layer.

4,135,331

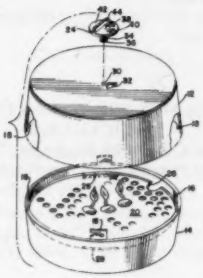
SEEDLING SPROUTER

Stewart Lamlee, 55 W. 86th St., New York, N.Y. 10024

Filed Mar. 22, 1977, Ser. No. 780,080
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—61 **5 Claims**

1. A sprouter for seeds comprising a first member having a first generally circular enclosing side and a bottom portion, a second member having a second generally circular enclosing side and a top portion, the perimeter of said first enclosing side being approximately equal to the perimeter of said second enclosing side, a screen located within said first member, means for spacing said screen from said bottom portion, closure means mounted on said second member, and locking means for locking said first and second members to one another,

the locking means including means for spacing said first member from said second member in a stable position and for creating an annular air gap therebetween allowing communication between the interior of the sprouter and the exterior thereof, and means for securing said first member to said second member in a mutually contacting relationship to close said annular air gap, said locking means comprising a plurality of plates attached to said first



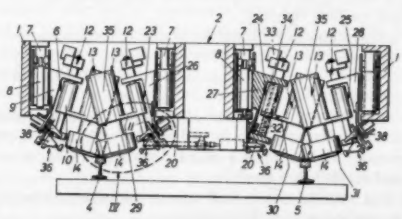
enclosing side and a plurality of pegs attached to said second enclosing side, said plates each having a tortuous slot therein dimensioned to receive one of said pegs, said slot including an entrance portion, a dimple portion, and an end portion, wherein the circular periphery of said first enclosing side is in contact with the circular periphery of said second enclosing side when said peg is in said entrance portion or said end portion, and wherein said two circular peripheries are spaced one from the other when said peg is in said dimple portion.

4,135,332

RAIL GRINDING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jul. 23, 1976, Ser. No. 708,017
Claims priority, application Austria, Dec. 1, 1975, 9133/75
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—5 D **30 Claims**



1. A mobile rail grinding machine for grinding the running surface of the rails of a track, each track rail having a vertical plane of symmetry and respective sides of the running surface on each side of the plane of symmetry, comprising

(1) a machine frame;

(2) undercarriages mounting the machine frame for mobility on the track rails in an operating direction, the undercarriages having

(a) track rail engaging elements;

(3) mechanisms for pressing the track engaging elements without play against the track rails they engage; and

(4) a grinding module mounted for power-driven vertical movement on the machine frame, the module being associated with a respective one of the track rails and being

arranged laterally adjacent a respective side of the one track rail, the grinding module including

(a) a carrier frame,

(b) a grinding unit carrier mounted on the carrier frame adjustably positionable relative to the machine frame and the carrier frame,

(c) a grinding unit mounted on the carrier, the grinding unit having a rotatable rail grinding tool with a grinding surface arranged for continuously grinding the side of the running surface of the one track rail as the machine frame and the grinding unit moves in the operating direction, and

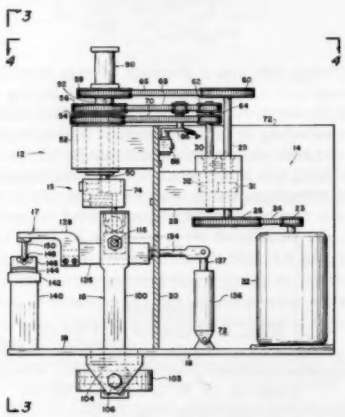
(d) a shaping tool for profiling the grinding surface of the grinding tool.

4,135,333

APPARATUS FOR GRINDING A CYLINDRICAL OPTICAL LENS

Joe D. Stith, Rte. 4, Box 640, Muskogee, Okla. 74401

Filed Oct. 28, 1977, Ser. No. 846,417
Int. Cl.[2] B24B *13/02*
U.S. Cl. 51—160 **6 Claims**



1. Apparatus for grinding cylindrical lenses, comprising:

(a) a frame including at least a base and a vertical bracket;

(b) a bearing block supported by said frame and having a first vertical opening;

(c) a first stub shaft journalled in said first opening, a second vertical opening in said first stub shaft, with axis parallel to, but offset a selected distance from the axis of said first stub shaft;

(d) a second stub shaft journalled in said second opening, a third vertical opening in said second stub shaft, with axis parallel to, but offset a selected distance from the axis of said second stub shaft;

(e) first vertical drive shaft means extending through and journalled in said third opening;

(f) motor means and means to drive said first stub shaft, said second stub shaft, and said first vertical drive shaft at selected speeds, in selected directions, respectively;

(g) a driving hub on the bottom end of said first vertical shaft, including a first driving pin with axis parallel to but offset a selected distance from the axis of said first vertical shaft;

(h) a vertical post and means to support said post at its bottom end for rotation laterally, but without rotation about the axis of said post, responsive to said first driving pin;

(i) a second shaft means transverse to said post and at least one substantially horizontal arm journalled on said second shaft means, said at least one arm carrying a second driving pin;

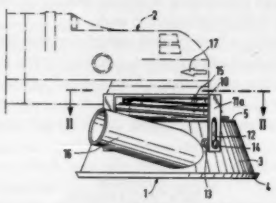
(j) lap means and means controlled by said second drive pin to press and move a lens block and lens over said lap.

4,135,334

DUST EXHAUST HOOD

Günter Rüdiger, Gothenburg, Sweden, assignor to Firma Robert Bosch GmbH, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 727,077
Int. Cl.[2] B24B *55/06*
U.S. Cl. 51—273 **4 Claims**



1. A dust exhausting hood, for mounting on a head of a surface-treating machine so as to surround a rotary tool of the machine, comprising:

(i) a clamping ring for placing about the head of the machine coaxially with the rotary tool

(ii) means for releasably tightening said clamping ring into engagement with the machine head

(iii) guide means integral with said clamping ring, said guide means including a first portion extending radially outwards from said ring, and a second portion extending from said first portion substantially parallel to the axis of the ring,

(iv) a mantle having a side wall and an apertured top wall, the lower end of the mantle being open, said mantle being disposed with its side wall positioned within an area bounded by the guide means, the side wall being connected to the guide means for relative movement of the mantle axially with respect to the guide means

(v) a helical spiral spring engaged under compression between the first portion of the guide means and the top wall of the mantle, to urge the mantle axially away from the clamping ring; and

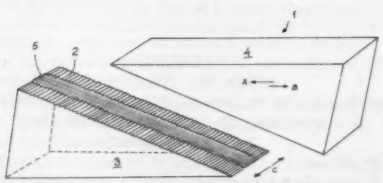
(vi) means associated with said mantle side wall for exhausting dust from said hood.

4,135,335

BLOCKING-UP WEDGE

Karsten Jensen, Strandvejen 93, Frederiksvaerk, Denmark (DK-3300)

Filed Mar. 8, 1977, Ser. No. 775,498
Claims priority, application Denmark, Mar. 19, 1976, 1200/76
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—126 **4 Claims**



1. Blocking-up wedges of the kind used in pairs e.g. by the leveling of joists wherein both of said wedges are identical to each other, and each of said wedges consists of a prismatic-shaped body the terminal surfaces of which being triangles, by which at least one wedge surface of each of said wedges offers a relatively great friction in such a direction that the mutual

displacement of the pair of wedges reducing the distance between the parallel supporting surfaces of the pair of wedges is mainly prevented, as well as of controls for the prevention of mutual lateral shifts of the wedges,

wherein said at least one wedge surface comprises serrated portions extending from an upper end to a lower end of said wedge and a plurality of undulating portions extending in a direction transversely of the direction in which said serrated portions extend.

4,135,336

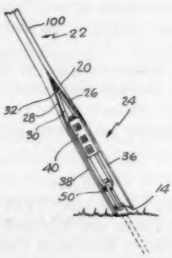
PLASTIC GUY WIRE GUARD AND METHOD OF MAKING AND USING SAME

Stephen B. Bogese, II, Roanoke, Va., assignor to Virginia Plastics Company, Roanoke, Va.

Continuation-in-part of Ser. No. 625,385, Oct. 24, 1975, Pat. No. 3,999,340. This application Dec. 23, 1976, Ser. No. 753,871

Int. Cl.[2] E04H *12/20*

U.S. Cl. 52—147 **17 Claims**



1. A method of installing a plastic tube having a substantially constant diameter unflared portion and a heat shrinkable flared end onto a guy wire installation having a relatively small diameter guy wire and a relatively large diameter anchor assembly for connecting said guy wire to the ground, which comprises the steps of positioning the constant diameter, unflared portion of said tube said guy wire, positioning said flared end about said anchor assembly and applying heat to said flared end.

4,135,337

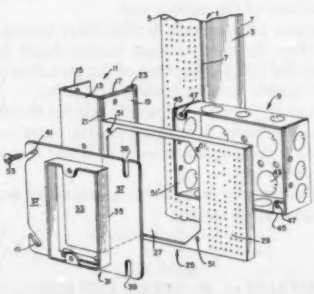
MOUNTING MEANS FOR ELECTRIC OUTLET BOX

Lewis B. Medlin, 735 S. 26th Pl., Arlington, Va. 22202

Filed Sep. 12, 1977, Ser. No. 832,383

Int. Cl.[2] H02G *3/08*

U.S. Cl. 52—221 **6 Claims**



1. Mounting means for an electric junction box, or the like, including in combination, a channel shaped bracket to be affixed to and about a stud in building construction, said bracket having a web and a pair of substantially parallel arms one extending from each edge of the web, a member fixed to and extending laterally from one of said arms of said bracket and having an opening therein, said laterally extending member being of planar shape and being substantially rigid, an electric junction box fixed to one side of said laterally extending member in position with respect thereto so that the interior of the electric junction box is accessible through said opening in the laterally extending member, and a dry wall ring fixed to the other side of said laterally extending member and said electric junction box and said laterally extending member maintaining said electric junction box and said dry wall ring in operative position.

4,135,338

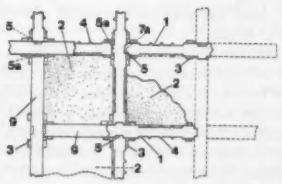
MODULAR ELEMENTS FOR COVERING FLOORS AND WALLS WITH TILES AND THE LIKE

Alberto Malavasi, Piazza Citta Leonia, 9, Rome, Italy

Filed Apr. 20, 1977, Ser. No. 789,207

Int. Cl.[2] E04C *5/18;* **E04F** *13/08*

U.S. Cl. 52—387 **10 Claims**



1. A prefabricated modular element for forming a surface covering for a base such as a wall or a floor surface, in which the surface covering includes tiles which can be made from different component materials and the outer facing surface is free from lumps and unevenness, comprising:

a plurality of rigid bar shaped elements each including connection means at their opposite ends and at the midpoint thereof between said opposite ends for connection of individual of said elements together to form a reticular support adapted for placement onto said base;

each of said bar shaped elements including a lower facing surface and an upper facing surface having a preselected spacing therebetween;

a plurality of supporting ledges connected with said lower facing surface of each said bar shaped elements, each said ledges being in the form of projecting tabs having a lower surface flush with the lower surface of said bar shaped elements, the thickness of said tabs being less than said preselected spacing so that the upper surface of said tab is below the upper surface of said bar shaped elements;

said preselected spacing being at least equal to the thickness of said tiles whereby said tiles are supported by said tabs in said reticular support spaced from said base, the spacing between said base and the bottom surface of said tiles being at least equal to the thickness of said tabs;

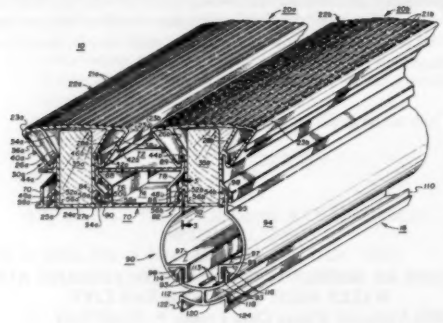
said rigid bar shaped elements being interconnected by said connection means to form with said base a cavity to receive said tiles;

adhesive material placed into and onto said base, said cavity and the bottom surface of said tiles being pressed against said adhesive material to form a firm bond with said adhesive material, said bottom surface of said tiles solely holding said tabs to said base for connection thereto of said reticular support together with said tiles.

4,135,339
SLATTED FLOOR SYSTEM

Donald P. Pawlitschek, R.R. #2, Heron Lake, Minn. 56137

Filed May 20, 1977, Ser. No. 798,751
Int. Cl.[2] A01K *1/015*
U.S. Cl. 52—660 15 Claims



1. A slatted floor system comprising:

a plurality of elongated, spaced, generally parallel slats, each slat having

a top, load carrying surface with spaced-apart, opposite outer edges,

a bottom surface substantially parallel to said top surface,

a pair of side surfaces integral with said top surface and said bottom surface, said side surfaces being joined with the top surface along lines recessed from the outer edges of the top surface, said side surfaces further tapering toward each other in first portions adjacent the top surface, then extending substantially parallel to each other and vertically relative to said bottom surface in second portions thereby forming with said top and bottom surfaces a generally Y-shaped, integral, fully enclosed longitudinal main compartment,

a first pair of projection receiving means extending longitudinally along said tapered first portion of the side surfaces, and

a second pair of projection receiving means extending longitudinally along said second portions of the side surfaces;

a plurality of connectors, for connecting and locking adjacent slats in spaced-apart relationship, each connector having a first pair of projections, each such projection being receivable by one of said first pair of projection receiving means on each of two adjacent slats, and a second pair of projections, each such projection being receivable by one of said second pair of projection receiving means on each of two adjacent slats, at least one of said first and second pairs of projections being adapted to interlock with its corresponding projection receiving means on adjacent slats; and

a plurality of reinforcing members internally received in, fully enclosed by, and extending substantially the full length of, said longitudinal main compartments of said slats.

4,135,340
MODULAR DRILL RIG ERECTION SYSTEMS

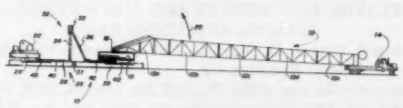
David F. Cox, and Tom T. Hashimoto, both of Victoria, Tex., assignors to Chloride Group Limited, London, United Kingdom

Filed Mar. 8, 1977, Ser. No. 775,558
Int. Cl.[2] E04H *12/34;* E21C *5/00*
U.S. Cl. 52—115 6 Claims

1. In a drilling rig having a base for placement on the ground at a well site with a supporting floor structure releasably connected to the base and supported on parallel spaced legs on each side of said base pivotally attached between the supporting floor structure and the base whereby the supporting floor structure is movable from the base to an elevated position above thhe base upon rotation of the legs to a vertical position, perpendicular to the base, the improvement comprising:

a pair of strong back towers, one mounted on each side of the base near midway the length thereof;

sheave means supported on the top of each of said strong back towers with the axes thereof transverse to the length of the base;



sheave means mounted on said supporting floor structure;

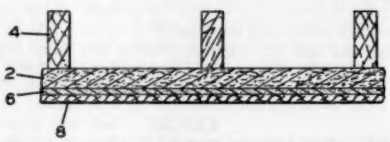
cable means releasably connected to and passing successively said sheave means on said floor structure and over said sheave means supported on said strong back towers; and

hydraulic linkage means coupled to said cable means for exerting a force through said cable means for raising the supporting floor structure to the elevated position above the base and adjacent said strong back towers.

4,135,341
ROLL-ON CEILING FOR MANUFACTURED HOMES

Norman A. Johnson, Lititz, and Raymond C. Kent, Lancaster, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 20, 1977, Ser. No. 807,839
Int. Cl.[2] B32B *3/00, 5/06;* E04C *2/02;* E04H *1/12*
U.S. Cl. 52—316 1 Claim



1. A ceiling for a manufactured home consisting of:

(a) a support framework,

(b) backer-board means on the support framework to provide the base of the ceiling, and

(c) a one-piece construction flexible sheet having a decorative surface fastened to said backer-board means and covering the complete ceiling of the manufactured home,

(1) said flexible sheet consisting of a scrim

(2) positioned thereon and needle-bonded thereto are two webs of different fiber materials, the outer web being a material which will heat emboss better than the underlying web, and

(3) said outer web at least being embossed and forming said decorative surface.

4,135,342
INSULATED METAL ROOFING AND SIDING SYSTEM

Donald P. Cotter, San Francisco, Calif., assignor to Field Form, Inc., San Francisco, Calif.

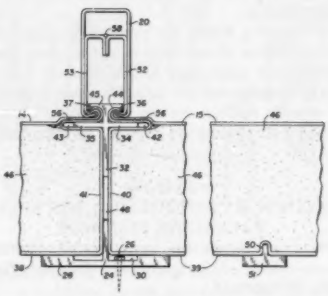
Filed Oct. 26, 1977, Ser. No. 845,691
Int. Cl.[2] E04C *1/34*
U.S. Cl. 52—461 11 Claims

1. An insulated roofing and siding system for a supporting structure comprising:

a plurality of elongate insulation bins adapted to be located

side by side on the roof or wall of the supporting structure, each said bin including a generally flat base and vertical side walls each defining an outwardly opening channel proximate the upper extremity of the side wall, said insulation bins adapted to receive a quantity of insulation material in the cavity defined by the base and the side walls of each said bin;

a plurality of elongate plates adapted to be located over the respective insulation bins;



a plurality of discrete clips attached to the supporting structure and disposed between adjacent side walls of the various insulation bins, said clips each including an upstanding portion having transverse projections extending therefrom for engaging the channels in adjacent insulation bins to attach the bins to the supporting structure; and

a plurality of elongate battens constructed of resilient material, each batten including a slit along the length of said batten so that the batten can extend over adjacent flanges on contiguous lateral edges of two said plates and provide weatherproofing at said edges.

4,135,343

METHOD AND APPARATUS FOR FRAMING PHOTOGRAPHIC FILM SECTIONS IN SLIDE FRAMES

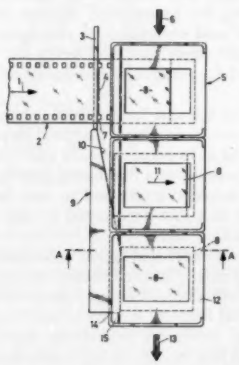
Otfried Urban; Peter Mundt, both of Garmisch-Partenkirchen, and Arnold Neuhold, Farchant, all of Fed. Rep. of Germany, assignors to Gelmuplast Peter Mundt KG, Farchant, Fed. Rep. of Germany

Filed Sep. 1, 1976, Ser. No. 719,529

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1975, 2539199

Int. Cl.[2] B65B *17/00, 63/00*

U.S. Cl. 53—435 **5 Claims**



1. A method of mounting film sections in slide frames consisting of superposed interconnected frame portions which can be flexed apart, comprising the steps of bringing said slide frames successively to a film-severing station and flexing said frame portions apart to define an opening at one edge thereof, intermittently advancing a film to said severing station until the leading end of said film is partially inserted in said frame through said edge opening, severing a film section from said leading end along a line of cut disposed so that a portion of said severed section remains protruding from said frame through said edge opening, feeding said frame with partially inserted film section in a direction away from said severing station towards a stationary guide having a cam surface extending obliquely with respect to said frame feeding direction, continuing said feeding of said frame so that a corner of said protruding film section portion engages said cam surface and rides therealong, causing said cam surface to extend into said opening of said frame, whereby said protruding film section portion is progressively pushed at right-angles to said frame feeding direction through said edge opening into said frame during continued feeding thereof, and allowing said frame portions to flex together again after said film section has been fully inserted past said edge opening.

3. Apparatus for mounting film sections in slide frames consisting of superposed interconnected frame portions which can be flexed apart, comprising means for bringing said slide frames successively to a film-severing station, means effective to flex said frame portions apart to define an opening at one edge thereof, means for intermittently advancing a film to said severing station until the leading end of said film is partially inserted in said frame through said edge opening, means for severing a film section from said leading end along a line of cut disposed so that a portion of said severed section remains protruding from said frame through said edge opening, means for feeding said frame with partially inserted film section in a direction away from said severing station towards a stationary guide, said guide comprising a cam surface which extends obliquely with respect to said frame feeding direction and has a trailing cam surface portion projecting into the feed path of said frame, whereby a corner of said protruding film section portion engages said cam surface and rides therealong, said trailing cam surface portion being disposed so as to enter between said slide frame portions.

4,135,344

DEVICE TO CHECK AND DISCARD LENGTHS OF WRAPPING MATERIAL (FOIL) IN VERY HIGH SPEED PACKET CIGARETTE PACKERS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Mar. 25, 1977, Ser. No. 781,522

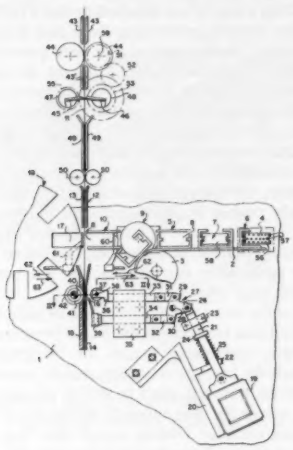
Claims priority, application Italy, Mar. 31, 1976, 3391/A76

Int. Cl.[2] B65B *57/12*

U.S. Cl. 53—54 **2 Claims**

1. A device to check and discard lengths of wrapping material in high speed packet cigarette packers, comprising a conveyor with compartments having intermittent movement to feed bundles of cigarettes from their bundling zone to a final position previous to their transfer to a first wrap station, controls placed along the said conveyor to check for missing or faulty bundles, means of expulsion placed along the same conveyor downstream of said controls and commanded by them for rejecting faulty bundles, a feed line for feeding the lengths of wrapping material to a stay position along a vertical plane between said final position of the bundle of cigarettes and said first wrap station and comprising a stop check for the single lengths fed along said vertical plane disposed adjacent the final position of the bundle of cigarettes, and means to transfer the single bundles of cigarettes together with a length of wrapping material from said final position to said first wrap station which device includes at least one turning wheel in continuous motion on an axis and parallel to said vertical feed plane and adjacent to it on the front portion of said stop check, idlers placed with respect to said feed plane on the opposite side of the said turning wheel in continuous motion, mounted on an axis parallel to the axis of said wheel and spaced therefrom, a

means of command by electromagnetic action for said controls, mechanical links for the idlers and the stop check coupled to said means of command, so as to switch with respect to said vertical feed plane the positions of said stop check and



idlers, rspectively, by displacing the first from said feed plane and bringing the second into contact with said turning wheel in continuous motion for the removal on the part of the aforesaid controls of a length of wrapping material corresponding to a bundle which is missing or faulty.

4,135,345

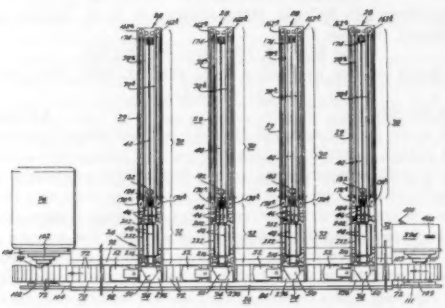
COOKIE DISPENSING APPARATUS

Walter W. Egee, Wallingford, Pa., and Clarence W. Cramer, Burlington, N.J., assignors to Campbell Soup Company, Camden, N.J.

Division of Ser. No. 764,190, Jan. 31, 1977, Pat. No. 4,085,563. This application Nov. 14, 1977, Ser. No. 851,067

Int. Cl.[2] B65B *57/12, 57/20*

U.S. Cl. 53—55 **1 Claim**



1. In apparatus comprising means for receiving cookies, delivery-line means for deliverng said cookies sequentially to a stacking chamber to form stacks of a predetermined number n of said cookies, and means for dispensing said stacks from said stacking chamber onto predetermined receiving portions of successive intermittently-moving trays when the trays are stationary in a loading position:

cookie-detector means for producing a cookie-indicating electrical pulse each time one of said cookies approaches said stacking chamber;

electrical counter means for counting said cookie-indicating pulses to produce n-count signals representing the arrival of each nth cookie at said cookie detector means;

means responsive to signals from said counter means for producing a stop signal when an additional cookie in excess of said n cookies reaches said cookie-detector means before said stack of n cookies has been dispensed from said chamber;

means for stopping said delivery-line means at least momentarily in response to said stop signal to prevent said additional cookie from being added to said stack of n cookies in said chamber;

tray-arrest sensing means for producing a tray-arrest pulse upon each arrest of said trays in said loading positions; and

electrical means responsive to said n-count signals and to said tray-arrest pulses for operating said dispensing means only when n cookies are stacked in said chamber and a tray is in loading position adjacent said dispensing means.

4,135,346

APPARATUS FOR CONTROLLING THE SPEED OF A PACKAGING MACHINE

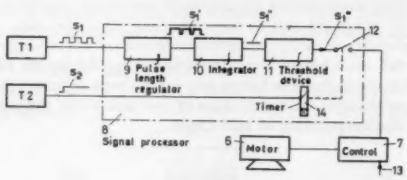
August Rebsamen, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Rheinfall, Switzerland

Filed Sep. 28, 1977, Ser. No. 837,411

Claims priority, application Switzerland, Oct. 6, 1976, 12642/76

Int. Cl.[2] B65B *57/16*

U.S. Cl. 53—494 **8 Claims**



1. A system for controlling the operating speed of a machine for packaging objects, said machine being driven by a motor and having an intake for receiving said objects and input conveying means for transporting said objects along an input path to said machine intake, said system comprising

a first sensor disposed at a first selected point along said input conveying means,

a second sensor disposed at a second selected point along said input path between said first point and said machine intake, said first and second sensors providing signals indicating the presence or absence of an uninterrupted series of said objects to be packaged at selected points along said input path and being the only such sensors provided for control of the operating speed of said machine,

motor control means for regulating the speed of said motor in dependence on signals provided by said first and second sensors so as to permit objects which are supplied to said input conveyor at a fluctuating rate to accumulate ahead of said machine intake and to then be packaged in said machine at a rate determined by the operating speed of said machine, and

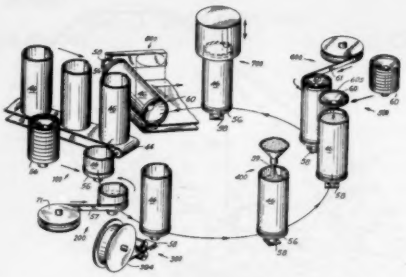
a signal processor, said signal processor comprising signal deriving means coupled to said first sensor for deriving a control signal from the signal provided by said first sensor, and signal delivery control means coupled to said signal deriving means for selectively delivering said control signal to said motor control means in dependence on the signal provided by said second sensor, said control signal causing said motor to either be driven at a speed approximately proportional to the value of said control signal or to be stopped.

4,135,347

METHOD AND APPARATUS FOR PRODUCING A DISPENSING TUBE

Loren L. Lowdermilk, Middletown, N.J., assignor to International Paper Co., New York, N.Y.

Filed Oct. 15, 1976, Ser. No. 732,706
Int. Cl.[2] B65B *61/18*; B65C *9/02*; B65B *3/06, 9/10*
U.S. Cl. 53—574 23 Claims



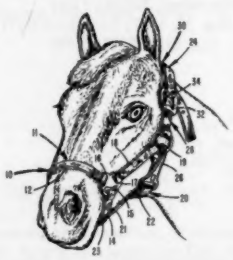
1. An apparatus for assembling dispenser tubes comprising:
(a) a turret including means around its periphery for retaining dispenser tubes, said turret being intermittently rotatable in increments to move said dispenser tubes successively from one operating station to another;
(b) means successively to feed said tubes to said turret at a preliminary operating station;
(c) means successively to feed nozzles to said turret and then to mount said nozzles on the ends of said tubes at a successive operating station;
(d) means successively to fill said tubes at a further successive operating station; and
(e) means succesively to position plungers in said tubes at a still further successive operating station.

4,135,348

FASTENING DEVICE FOR RELEASABLY OR NON-RELEASABLY FASTENING PARTS OF A HALTER TO EACH OTHER

Thomas A. Matthews, Richmond, Va., assignor to B. T. Crump Company, Inc., Richmond, Va.

Filed Jul. 6, 1977, Ser. No. 813,304
Int. Cl.[2] B68B *1/02*
U.S. Cl. 54—24 4 Claims



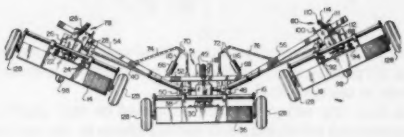
1. In a halter for an animal having a neck strap including two parts with free ends facing each other, the improvement comprising fastening means moveable between a first position for non-releasably fastening and a second position for releasably fastening the free ends of the two parts to each other and comprising: a buckle attached to the free end of one of the two parts, the free end of the other of the two parts containing a plurality of openings engageable by the buckle for non-releasably fastening the free ends of the two parts to each other; and stress releasable means having a first section containing a relatively high pile nap surface defined by myriad looped soft fibers and a second section longitudinally spaced from the first section having a surface containing opposed rows of stiff hook shaped needle-like locking fingers, the surfaces of the sections when engaged with each other resisting separation until a longitudinal force applied thereto exceeds a predetermined value, the stress releasable means being mounted on the free end of the other of the two parts in such manner that when the free end is passed through the buckle and folded back on the other of the two parts the surfaces of the sections are engaged with each other thereby releasably fastening the free ends of the two parts to each other.

4,135,349

CROP SHREDDER APPARATUS AND ADAPTER

Larry V. Schwertner, Rte. 1, Ballinger, Tex. 76821

Filed Feb. 25, 1977, Ser. No. 772,074
Int. Cl.[2] A01D *75/30*
U.S. Cl. 56—6 10 Claims



1. A shredder apparatus for connection to a vehicle for towing, comprising:
first and second shredders;
a first coupling assembly, including
a hitch for connection to the towing vehicle,
means for connecting to the first shredder and for pivoting on a first axis extending approximately horizontal and transverse to the direction of said towing;
a beam, disposing transverse to the direction of said towing, and connected at one end to the coupling assembly, pivotal on the second axis extending in the direction of said towing;
means mounted on the first coupling assembly for moving the beam, pivotal on said second axis, to a selected position, and holding the beam in the position;
a second coupling assembly, including means for connecting to the second shredder and connecting to the beam at a selected position along the beam, and for pivoting about a third axis extending in the direction of said towing and about a fourth axis extending approximately horizotal and transverse to said direction;
wherein said connecting by the coupling assemblies to the shredders is at forward portions of the shredders; and
further including, for each one of the shredders, means for flexibility linking a rear portion of said one shredder with the one coupling assembly connected thereto and for thereby limiting downward displacement of said rear portion relative to said one coupling assembly.

4,135,350

REAPING MACHINE FOR PARSLEY

Hirokazu Miyatake, Osaka, Japan, assignor to Kunimitsu Nagatoshi, Oxnard, Calif.

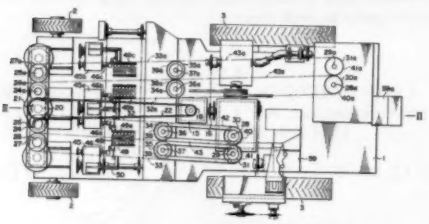
Filed Jan. 24, 1977, Ser. No. 762,167
Int. Cl.[2] A01D *37/00, 45/00*
U.S. Cl. 56—131 5 Claims

1. A reaping and bundling machine for parsley including:
(a) a chassis and a plurality of rotary disk cutters mounted on said chassis for rotating horizontally around their axis at the lower front of said chassis and slightly above the parsley field surface so that the cutter blades cut the parsley plants at their lower stems;
(b) a first pair of circulating elastic and resilient endless belts mounted on said chassis to receive and carry the top of the

cut parsley stems and means mounted on said chassis for driving said first pair of belts;

(c) a plurality of comb-like mechanisms mounted on said chassis adjacent said belts for scraping and cutting off yellowish lower leaves of the stems of the plants which are supported by and between said first pair of belts;

(d) a second pair of endless belts mounted on said chassis adjacent and below said first pair of belts, said second pair moving at the same speed as said first belts for receiving



said parsley leaves after scraping and cutting and supporting the parsley stems adjacent the bottom so as to maintain them in upright condition;

(e) at least one supporting arm mounted on said chassis to support and receive several parsley plants at the rear ends of the said belts;

(f) at least one binder for bundling up the parsley plants while supported by said arm; and

(g) at least one releasing mechanism for releasing said bundles of parsley after binding.

4,135,351

ROTARY LAWN MOWER GRASS MULCHER

Sahag C. Akgulian, Racine, Wis., assignor to Jacobsen Manufacturing Company, Racine, Wis.

Filed Jul. 1, 1977, Ser. No. 812,047
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—255 **5 Claims**

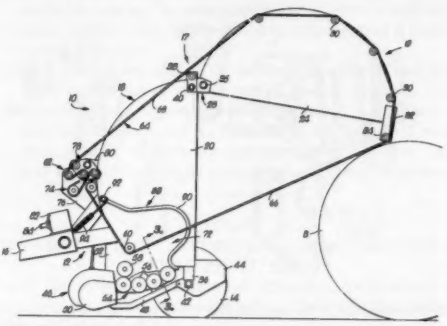
1. A rotary lawn mower grass mulcher comprising a mower housing having a grass outlet through which the cut grass is discharged, a grass mulcher assembly removably attached to said housing and extending across said grass outlet and including a first and a second mulcher plate, said assembly including a first mulcher plate extending across said outlet for initially blocking the discharge of cut grass and having a plurality of holes extending therethrough for the passage of air from said housing, and said assembly including a second mulcher plate attached to said first mulcher plate and extending spaced therefrom and having holes extending therethrough in positions with the axes therof offset from the axes of said holes of said first mulcher plate for further and secondarily blocking the discharge of any cut grass coming through said first mulcher plate while having air pass from said housing and through said holes in said second mulcher plate, and with said mulcher plates thereby retaining said cut grass in said housing for mulching the cut grass, said second mulcher plate having inturned ends which present edges in contact with said first mulcher plate at all of the edges of said second mulcher plate except the lower edge thereof.

4,135,352

SEMICONTINUOUS LARGE ROUND BALING MACHINE

Edward L. Swenson, and Thomas W. Ankenman, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 7, 1976, Ser. No. 748,315
Int. Cl.[2] A01D *39/00*
U.S. Cl. 56—341 **12 Claims**



1. In a machine for forming round bales of crop material:

means presenting movable, upwardly facing surface;

a pickup adapted for directing crop material to said surface;

a flexible web supported over said surface and cooperating therewith to define an enclosed, substantially cylindrical, radially expansible bale-forming chamber for rolling said crop material into a diametrically increasing round bale,

said web having a shiftable portion for opening said chamber to permit ejection of said bale from the chamber when the bale is fully formed; and

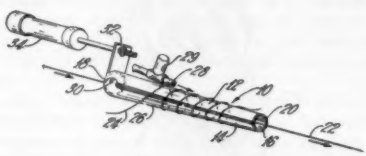
structure cooperable with said surface and said web to reestablish the closure of said chamber after said bale is ejected and while said portion remains in the open position such that crop material subsequently delivered to said surface is retained in said chamber for inclusion in the next bale.

4,135,353

ENTANGLEMENT OF A FIRST STRAND WITH A SECOND STRAND

Arnold J. Eisenberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 16, 1977, Ser. No. 833,771
Int. Cl.[2] D01H *15/00*
U.S. Cl. 57—22 **9 Claims**



1. Apparatus for entanglement of a first strand and a moving second strand comprising:

(a) a member having a passageway therethrough, said passageway adapted for the passage of said second strand therethrough, said member being adapted for the circumferential positioning of said first strand thereon;

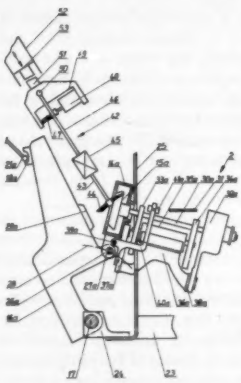
(b) repositioning means for moving said first strand from said periphery of said member into circumferential entanglement with said second strand proximate the passageway outlet; and,

(c) means for reducing the circumference of said member at the outlet end of said passageway.

4,135,354
OPEN-END SPINNING MACHINE WITH A MAINTENANCE DEVICE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7341 Bad Überkingen, Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Germany

Filed Oct. 4, 1977, Ser. No. 839,253
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648066
Int. Cl.[2] D01H *11/00, 1/12*
U.S. Cl. 57—302 **12 Claims**



1. Open-end spinning machine apparatus comprising a plurality of spinning assemblies and at least one maintenance device movable along the open-end spinning machine to respective maintenance positions adjacent the respective spinning assemblies, said maintenance device being provided with opening means for opening a spinning assembly and with advancing means for advancing a cleaning device to a spinning rotor provided with one open side and accessible by the opening of the spinning assembly, into which spinning rotor a cleaning element of the cleaning device is introduced while the spinning rotor is separated from its drive means, wherein the maintenance device is equipped with rotor speed control means for controlling the rotational speed of the spinning rotor being cleaned,

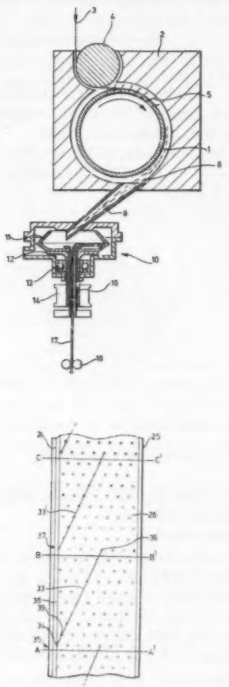
and wherein the rotor speed control means includes a rotor brake carried by the maintenance deivce and advanceable to the spinning rotor from outside.

4,135,355
OPENING ROLLER FOR AN OPEN-END SPINNING MACHINE

William R. Stewart, Strathmartine, Scotland, assignor to Wm. R. Stewart & Sons (Hacklemakers) Ltd., Dundee, Scotland

Filed Aug. 29, 1977, Ser. No. 828,821
Claims priority, application United Kingdom, Oct. 4, 1976, 41088/76
Int. Cl.[2] D01G *15/14;* D01H *1/12*
U.S. Cl. 57—58.91 **6 Claims**

1. An opening roller for use in an open-end spinning machine comprising an external surface carrying an array of pins arranged in repeating patterns, each pattern including from 7 to 12 axially extending rows of equally-spaced pins, the relative dispositions of the pins in adjacent rows being such that the pins lie on lines parallel to a helix which passes through points in the first lines of two adjacent patterns, which points are axially off-set by three times the axial spacing of the pins in 7- or 8- row patterns, four times the axial spacing of the pins in 9-

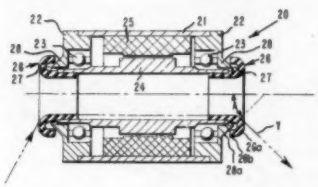


or 10-row patterns or five times the axial spacing of the pins in 11- or 12-row patterns.

4,135,356
FRICTION FALSE TWISTER

Michael J. Wolstencroft, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Filed Feb. 15, 1978, Ser. No. 878,002
Claims priority, application Canada, Jul. 18, 1977, 282966
Int. Cl.[2] D01H *7/92;* D02G *1/02*
U.S. Cl. 57—343 **6 Claims**



1. In a rotatable twist tube device for false twist texturing a continuous filament thermoplastic yarn being passed through the twist tube, in which the twist tube comprises a hollow shaft rotor constituted as the rotor of an electric motor having an axis of rotation, a tubular motor body having opposite ends, two bell housings, one attached to each end of the motor body, house ball bearings which support the hollow shaft rotor near each of its ends, a friction bushing positioned in each end of the hollow shaft rotor and projecting therefrom adjacent to a bell housing, the friction bushings each having a rounded front

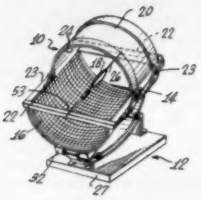
friction surface and a back surface extending outwards from the hollow shaft rotor, the improvement comprising an annular extension of each bell housing projecting beyond the end of the hollow shaft rotor and encompassing a portion of the adjacent bushing.

4,135,357

SOLAR CHRONOMETER

George Ashton, Studio City, Calif., assignor to L. M. Dearing Associates, Inc., Studio City, Calif.

Filed Jun. 16, 1977, Ser. No. 807,217
Int. Cl.[2] G04B *49/04*
U.S. Cl. 58—1 R 22 Claims



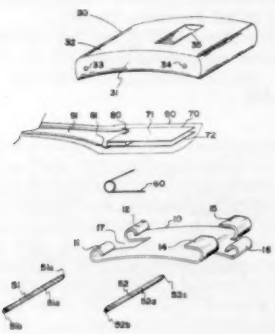
1. A solar chronometer comprising:
a style;
means for supporting said style in alignment in accordance with the celestial pole;
an equatorial member;
means for supporting said equatorial member in alignment with the equator; and
a chart arranged to have two intersecting shadows cast thereon by said style and said equatorial member, said chart bearing hour indicia for indicating the time of day in accordance with the position of the intersection of said shadows.

4,135,358

ATTACHMENT FOR AN ELECTRONIC WATCH SYSTEM

Tom L. Ricca, 1407 Wyandotte Rd., Columbus, Ohio 43212

Filed Feb. 14, 1977, Ser. No. 768,646
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 R 2 Claims



1. In a watch system comprising a case containing most parts of the watch, a band attached to said case, means for securing said band around a wrist of a person, the electronics of said watch system requiring a momentary change in the conductivity of one electrical path to cause the display of a selected set of data of said watch to appear, a wrist actuator for said momentary change in the conductivity comprising:
a. a support made of one of the general classes of firm materials characterized by brass, stainless steel and hard plastics, having essentially the shape of a rectangle thereof the first two sides parellel to each other has length about the same as the width of said band and the two remaining sides are oriented essentially in the longitudinal direction of said band;
b. said support having essentially cylindrical bearings suitably formed at one of said first sides and longitudinally oriented in the same direction as said first sides;
c. said support having U-shaped formings at the other side of said first sides;
d. means for fastening said support to said watch system at a location between 45 degrees and 145 degrees from the case of said watch;
e. a plate made of one of the general classes of firm materials characterized by brass, stainless steel and hard plastics having essentially the shape of a thin-walled rectangular box thereof with one of the two largest sides missing
f. the remaining largest side of said plate having a boss of suitable shape and size located near the center of said side and protruding toward the inside of said rectangular box;
g. means for fastening rotatably said plate to said bearings of said support to make them form essentially together a complete six-sided box;
h. spring means for permanently causing a swinging of said plate around said bearings and away from said support with suitable strength in the absence of any external force;
i. means for putting a first stop on said swinging at a suitable distance between said plate and said support, said means for putting said first stop being characterized by a retractable pin of adequate diameter fastened at its both ends onto said plate by means of apertures suitably provided for on said plate and the longitudinal part of said pin being caused to rest on the inside of one of the legs of said U-shaped formings by action of said spring means;
j. an electronic switch characterized by two strips of elastic metal fastened on opposite sides of a suitably dimensioned board of insulator at one end and causable to touch each other at the other end by forces tending to bring said strips closer to each other;
k. means for establishing said electrical path between said switch and the electronics of said watch system;
l. means for insulating electrically said switch from said plate and said support;
m. said switch being fastened between said support and said plate and suitably dimensioned and positioned to cause said strip to touch each other by simultanous action of said boss and said support on said strips when adequate pressure is exerted in the manner that brings said plate closer to said support and to move apart from each other by natural elasticity when said plate swings back to said first stop when said adequate pressure is removed;
n. whereby applying momentarily said adequate pressure in the direction that brings said plate closer to said support causes the conductivity of said electrical path of the electronics of said watch to change momentarily and consequently causes the display of a selected set of data of said watch to appear.

4,135,359

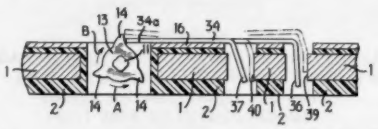
ELECTRONIC TIMEPIECE WITH THE AMENDING MEANS

Kenji Yajima, 6-31-1, Kameido, Koto-ku, Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,629
Claims priority, application Japan, Mar. 5, 1976, 51-23846
Int. Cl.[2] G04B *27/00*
U.S. Cl. 58—85.5 14 Claims

1. An electronic timepiece comprising in combination a base plate, a stem member mounted for rotary movement and axial movement relative to said base plate, a cam member on said stem member and rotatable therewith, electronic circuitry on said base plate including first function-controlling switch means actuatable by axial movement of said stem member and second function-controlling switch means actuatable by said cam member upon rotation of said stem member, said second

function-controlling switch means comprising first and second switch portions on said base plate and a spring switch plate mounted on said base plate and having first and second contact portions engageable respectively with said first and second switch portions on said base plate, said switch plate being engageable by said cam member when rotated in one direction



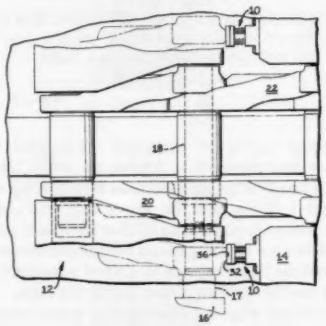
to bring said first contact portion of said switch plate into engagement with said first switch portion on said base plate and being engageable by said cam member when rotated in the opposite direction to bring said second contact portion of said switch plate into engagement with said second switch portion on said base plate.

4,135,360

POSITIONING APPARATUS FOR A TRACK ASSEMBLY MACHINE

Roy D. Morley, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 8, 1978, Ser. No. 875,965
Int. Cl.[2] B21L *9/06*
U.S. Cl. 59—7 **9 Claims**



1. A positioning apparatus for a track assembly machine for forcibly connecting pins and links and forming a track chain, comprising:

means for initially positioning the link and automatically repositioning the link to a preselected location relative to a pin in response to forces subjected upon the link by the track assembly machine, said means including

a stop member positioned at a location sufficient for initially positioning the link prior to connecting the pin and link; and

a spring positioned at a location sufficient for automatically repositioning the stop member and aligning the pin and link in response to said forces urging the link against the stop member.

4,135,361

SELF-CONTAINED HEAT GENERATING SYSTEM

David B. Eisenhaure, Hull, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

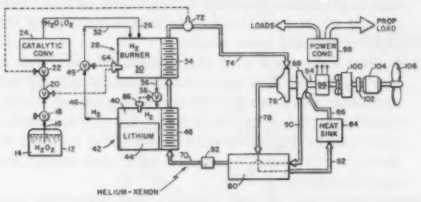
Filed Oct. 26, 1976, Ser. No. 735,748
Int. Cl.[2] F02C *3/20*
U.S. Cl. 60—39.02 **18 Claims**

11. A method for producing heat from hydrogen peroxide and an active metal in a closed cycle, high energy density generating process, said method comprising the steps of:

dissociating said liquid hydrogen peroxide from a source thereof into water vapor and oxygen;

communicating said water vapor and oxygen into a first reaction heat transfer vessel;

combining said oxygen with hydrogen in an exothermic reaction to produce water and heat in said first reaction heat transfer vessel;



communicating water from said first reaction heat transfer vessel into a second reaction heat transfer vessel;

combining said water with said active metal in an exothermic reaction to produce heat, an hydroxide of said metal and hydrogen in said second reaction heat transfer vessel; and

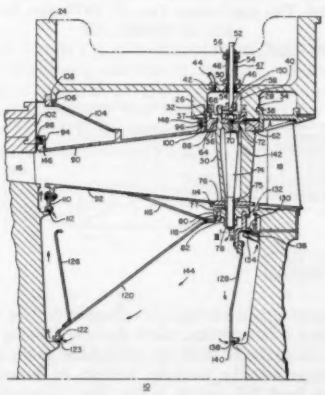
applying said hydrogen to said first reaction heat transfer vessel.

4,135,362

VARIABLE VANE AND FLOWPATH SUPPORT ASSEMBLY FOR A GAS TURBINE

Robert G. Glenn, Lower Moreland Township, Montgomery County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 656,496, Feb. 9, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,009
Int. Cl.[2] F02C *3/10;* **F01D** *7/12*
U.S. Cl. 60—39.16 R **9 Claims**



8. An assembly including structure defining a confined flow path for the motive fluid between the high-pressure turbine and the low-pressure turbine of a split shaft gas turbine engine and a variable vane disposed within said flow path generally adjacent said low-pressure turbine, said engine having a housing generally enclosing the rotating apparatus and providing radially inwardly extending flange means for supporting said assembly, said assembly comprising:

an outer shroud member supported from said flange means in a tongue-and-groove arrangement providing generally sealing engagement therebetween and defining a substan-

tially closed chamber between said housing and said outer shroud, said shroud further defining first and second openings communicating with said chamber;

radially extending hollow strut means stationarily secured to said outer shroud in flow communication with said first opening, said strut means having a bearing surface adjacent said outer shroud and extending radially inwardly therefrom to terminate in a generally cylindrical inner end;

an inner shroud member having an aperture for receipt of said strut means generally adjacent the radially inner end of said strut means said strut means providing the sole support for said inner shroud;

a hollow vane enclosing the portion of said strut means traversing said flow path and extending radially between said outer and inner shroud and engaging the bearing and cylindrical end of said strut means for rotation thereabout, said vane having an upwardly extending member passing through said second opening in said outer shroud and into said chamber;

means mounted on said housing and extending into said chamber to engage said upwardly extending member for rotationally positioning said vane;

a support ring in axial alignment with said inner shroud member and engaging the inner end of said strut means for the sole support of said support ring thereon, said ring radially spaced from said inner shroud member to provide a gap to accommodate radial movement of said inner shroud as said vane expands;

radially opposed wall members axially extending from adjacent said high-pressure turbine to said inner and outer shroud members respectively; and

means for supporting the radially inner wall member solely from said support ring.

4,135,363

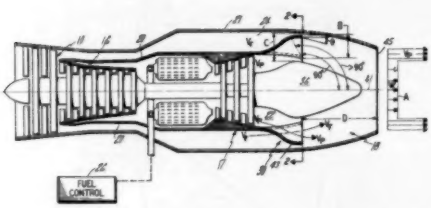
DEVICE TO PROVIDE FLOW INVERSION IN A TURBOFAN EXHAUST TAILPIPE TO ACHIEVE LOW JET NOISE

Allan B. Packman, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 687,079, May 13, 1976, abandoned. This application Jan. 27, 1977, Ser. No. 763,199

Int. Cl.[2] F02K *3/02*

U.S. Cl. 60—262 **4 Claims**



1. A fan-jet engine having a core engine portion including a turbine, and a fan portion, each portion defining coannular passages where the air from the fan exhaust in the outer coannular passage and the working medium in the core portion discharges from the turbine in the inner coannular passage, means downstream of said turbine for inverting said coannular passages so that the inner coannular stream exhausts from said engine as the outer coannular stream and the outer coannular stream exhausts from said engine in the inner coannular stream, said means including a plurality of circumferentially spaced lobes defining open ended channels, each alternate channel increasing in diameter in an upstream to downstream direction and each other alternate channel decreasing in diameter in an upstream to downstream direction, so that each alternate channel communicates with the outer coannular passage and the other alternate channel communicates with the inner coannular channel, the larger diameter portion of each increasing diameter channel having a discharge end having an outer wall, an exit plane through the exit end of each of the open ended channels, the angle of each plane through the exit end of said open ended channels with respect to the engine center line being equal and being more than 90° and the height of the lobe being 80% relative to the height of the annular passage in which the lobe is mounted.

4,135,364

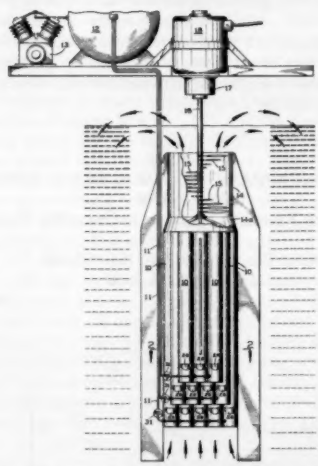
AIR LIFT PUMP ENERGY CONVERSION APPARATUS

Eugene D. Busick, 158 N. 110 St., Miami, Fla. 33161

Filed Dec. 12, 1977, Ser. No. 859,807

Int. Cl.[2] F16D *31/06;* **F04F** *1/18*

U.S. Cl. 60—325 **12 Claims**



1. In a pump having an elongated open-ended lift tube mounted to extend upward in a body of water, means for introducing a compressed gaseous fluid into said lift tube at a predetermined location near its lower end, and means for trapping said compressed gaseous fluid at the lower end of said lift tube until enough of said gaseous fluid accumulates to form a coherent bubble large enough to extend completely across the inside of said lift tube as it rises up the lift tube,

the improvement wherein said trapping means comprises:

an open-ended inner tube extending up inside said lift tube near the latter's lower end, said inner tube extending down below said predetermined location where the gaseous fluid is introduced into said lift tube;

and a transverse partition extending between said inner tube and said lift tube above said predetermined location where the gaseous fluid is introduced into the lift tube, whereby to trap said gaseous fluid between said tubes below said partition to form a coherent bubble which enters the lower end of said inner tube and rises up the latter before passing into the lift tube.

4,135,365

LOAD RESPONSIVE SYSTEM PUMP CONTROLS

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

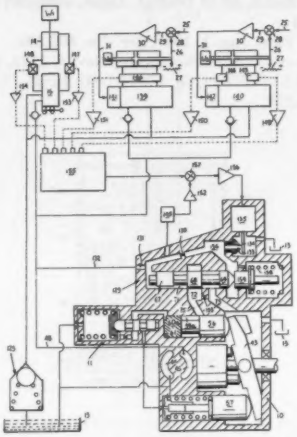
Continuation of Ser. No. 756,618, Jan. 4, 1977, Pat. No. 4,074,529. This application Aug. 29, 1977, Ser. No. 828,644

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—445 **16 Claims**

1. A fluid power and control system comprising a fluid pump, a fluid motor driving a load, and valve means interposed between said pump and said motor to control said load, flow changing means operable to vary fluid flow delivered from said pump to said fluid system to vary pressure in said fluid

system, control signal generating means having means to generate an electrical control signal proportional to magnitude of said load, and control means responsive to said electrical con-



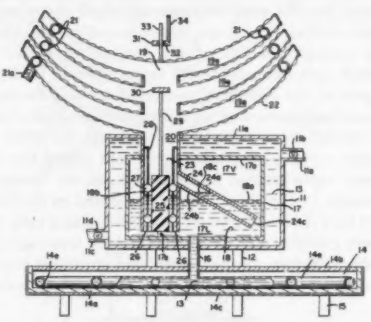
trol signal having means operable through said flow changing means to maintain a relatively constant pressure differential between pressure of said fluid system and pressure necessary to support said load.

4,135,366

VALVELESS DIFFERENTIAL TEMPERATURE ENGINE

Israel Siegel, 351 W. 71 St., New York, N.Y. 10023

Filed Aug. 2, 1976, Ser. No. 710,787
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—497 **14 Claims**



1. A differential temperature engine comprising a relatively warm and a relatively cold chamber,

a supply of evaporating liquid in said chambers to exert a vapor pressure in said chambers,

a valve-substitute consisting of a tube at an angled disposition communicating at one end with the cold chamber, the other open end of the tube adapted to be immersed in the liquid in the warm chamber,

said immersion adapted to be complete, when the operational level of the fluid is high, and to be incomplete when the operational level of the liquid is low,

said complete immersion completing a separation between the vapor phases of the warm and cold chambers, and said incomplete immersion permitting a communication between the vapor phases of the warm and cold chambers,

means for obtaining a temperature differential between the chambers,

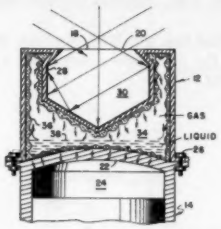
at least one moving member responding to vapor pressures, and means for translating said movement to useful work.

4,135,367

THERMAL ENERGY TRANSFORMER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of C. Martin Berdahl, Sierra Madre, and Carl L. Thiele, Pasadena, both of Calif.

Filed Aug. 12, 1977, Ser. No. 824,024
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—641 **10 Claims**



6. In combination with a heat operated engine including an expansion chamber, a thermal energy transformer for delivering to the heat operated engine thermal energy derived from solar flux, comprising:

A. a flux receiver having a first wall formed of heat conductive material defining a radiation absorption cavity for converting solar flux to thermal energy, and means defining for said cavity a solar flux entry aperture;

B. means mounting said flux receiver on a second wall comprising an energy input wall for said heat engine; and

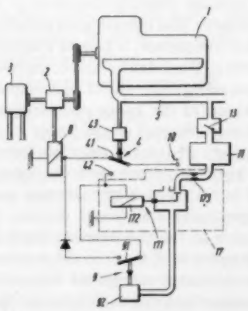
C. means defining between said first wall and said second wall a heat pipe chamber simultaneously communicating with said radiation absorption cavity and said expansion chamber through said first wall and said second wall.

4,135,368

MOTOR VEHICLE AIR-CONDITIONING SYSTEM

Paul Mohr, Wolfsburg, and Wolf D. Pokowitz, Muden, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 11, 1977, Ser. No. 776,855
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614290
Int. Cl.[2] B60H *3/04*; F25B *27/00*
U.S. Cl. 62—133 **21 Claims**



1. In an air-conditioning system for a motor vehicle having a compressor driven by the motor vehicle engine through a

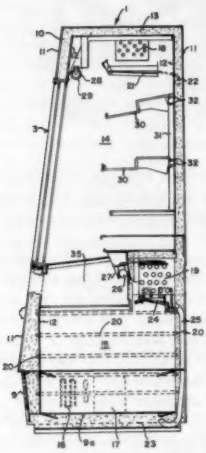
clutch, and having means for disengaging said clutch, thereby decoupling said compressor from said engine, when the vehicle is accelerating; the improvement comprising time delay means, actuated by the disengaging of said clutch, for automatically reengaging said clutch after a predetermined, fixed period of delay from the point of time that said clutch is disengaged.

4,135,369

DUAL TEMPERATURE MERCHANDISER

David F. Allgeyer; Donald A. Musgrave, and Lester F. Reifeiss, all of Conway, Ark., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 19, 1977, Ser. No. 834,235
Int. Cl.[2] A47F *3/04;* F25D *13/02*
U.S. Cl. 62—251 **30 Claims**



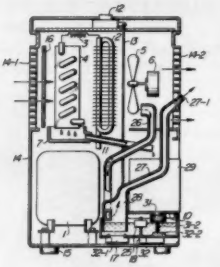
1. In a dual temperature merchandiser of the type containing a compartment for storage and display of chilled products and another compartment for storage and display of frozen products, the improvement which comprises said compartments being disposed as upper and lower compartments and having full communication therebetween, a single access aperture providing entrance into the two said compartments, openable door means provided for normally closing said access aperture, a single refrigeration means operatively associated with each of said compartments and controlled for maintaining a selected chilling temperature in the upper disposed compartment while providing a selected freezing temperature in the lower disposed compartment, said refrigeration means including a single condenser and compressor, a pair of evaporators operatively associated with said condenser and compressor and receptive of its conveyed refrigerant, one of said evaporators disposed in the higher region of the upper compartment, and the other evaporator being disposed in the lower compartment, valve means operatively connected between the upper and lower evaporators, a pair of thermostatic controls, one of each control arranged in one of each compartment and sensitive to the ambient temperatures maintained therein, the valve means being responsive to the thermostatic control disposed in the upper compartment such that the valve means remains closed and thereby bypassing refrigerant flow through the upper evaporator when a selected chilling temperature is maintained therein, and said valve means opens thereby allowing refrigerant flow through the upper evaporator when the said thermostatic control senses a rise above the said selected chilling temperature within said upper compartment.

4,135,370

HUMIDITY CONTROL APPARATUS

Taisei Hosoda; Hideo Uzuhashi; Nobuyuki Kobayashi, and Masaaki Tanaka, all of Tochigi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 3, 1977, Ser. No. 803,386
Claims priority, application Japan, Nov. 4, 1976, 51-131725
Int. Cl.[2] F25D *23/06;* F28D *5/00;* F25D *17/06*
U.S. Cl. 62—274 **6 Claims**



1. A humidity control apparatus comprising a casing, a dehumidifier and a humidifier both arranged in said casing,

said dehumidifier comprising a refrigeration circuit formed by a compressor, a condenser, a decompression device, an evaporator and again the compressor being connected in the order mentioned, a fan for passing air from the intake side of the casing to the outlet side of the casing through said evaporator and said condenser, and a tank for receiving and storing water condensate formed by the condensation of moisture on the surface of the evaporator;

said humidifier comprising a water chamber arranged beneath said water tank, a ultrasonic oscillator arranged at the bottom of said water chamber for generating water vapor, a water vapor chamber arranged above said ultrasonic oscillator, an intake duct one end of which opens at the downstream side of said fan and the other end of which opens into said water vapor chamber for bypassing a part of the airstream generated by said fan into said water vapor chamber, an outlet duct one end of which is connected to said vapor chamber and the other end of which opens to the exterior of said casing for ejecting water vapor carried by said bypassed air stream therethrough, and means detachably mounted on the bottom of said tank for feeding water contained in said tank into said water chamber and for maintaining the water level in said water chamber constant when said apparatus is used as a humidifier and the same tank is used as a feed water tank.

4,135,371

STORAGE ELEMENT FOR A SORPTION HEAT STORAGE SYSTEM

Fritz Kesselring, Schiedhaldenstr. 55, 8700 Küsnacht, and Siegfried Schilling, Sunnebüelstr. 41, 8604 Volketswil, both of Switzerland

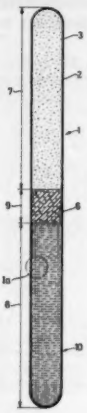
Filed May 13, 1977, Ser. No. 796,719
Claims priority, application Switzerland, May 18, 1976, 6181/76
Int. Cl.[2] F25B *17/00, 19/00;* F28D *13/00*
U.S. Cl. 62—477 **24 Claims**

1. A heat storage element for a sorption heat storage system comprising

a hermetically sealed vessel having a length which is a multiple of its crosswise dimension, said vessel having two subregions defining an interspace therebetween;

sorbate;

a first of said subregions containing a solid sorption medium to absorb sorbate; and

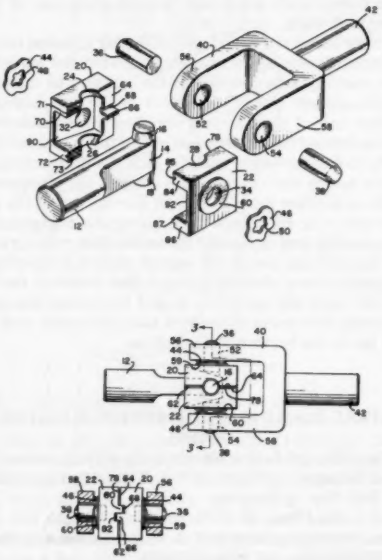


the second of said subregions containing an accumulator to collect, condense and hold back sorbate driven out of said sorption medium.

4,135,372
UNIVERSAL JOINT

Carl F. Benson, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed May 4, 1977, Ser. No. 739,515
Int. Cl.[2] F16D *3/26*
U.S. Cl. 64—17 SP **7 Claims**

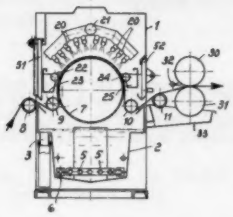


1. A universal joint comprising: a driving member; a driven member; means interconnecting said driving member and said driven member, said interconnecting means comprising a pair of blocks substantially encompassing the driving member, said blocks being dimensioned such that the inside of each block has surfaces which directly face one another in spaced relationship to provide a clearance; and pre-loading means comprising a block contacting member in contact with the outside surface of a block and low friction dry film lubricant bearing surfaces located between said blocks and said driving member.

4,135,373
FULL-WIDTH SCOURING STATION PARTICULARLY FOR DELICATE PRINTED FABRICS

Fulvio Conti, Via Statuto 84, Bergamo, Italy

Filed Sep. 27, 1976, Ser. No. 727,191
Claims priority, application Italy, Oct. 3, 1975, 27980175
Int. Cl.[2] D06B *1/02, 15/02*
U.S. Cl. 68—22 R **1 Claim**



1. A full-width scouring station, particularly for delicate printed fabrics, comprising, an outer casing, a tank within said casing and containing a scouring liquid, means in said tank for defining a maximum liquid level therein, at least one rotating drum having a substantially horizontal rotation axis extending over said tank and arranged entirely above said maximum liquid level, said drum having a perforated cylindrical surface, said cylindrical surface having an upper half and a lower half thereof, guide rollers coextensive with said cylindrical surface arranged at opposite sides of said lower half of said cylindrical surface to guide a fabric around said upper half of said cylindrical surface, a plurality of spray members located above said drum and extending over a sector of said upper half of said cylindrical surface and operative to direct scouring liquid jets onto a fabric portion extending over said cylindrical surface sector, at each opposite sides of said cylindrical surface, between said guide rollers and said sector and at the upper half of said cylindrical surface, a squeezer roller parallel to the axis of rotation of said drum and forming a nip therewith to press and squeeze the fabric against said upper half of the cylindrical surface of said drum thereby to prevent the liquid collected in the nip to seep through the nip, canalization members below said squeezer rollers and coextensive therewith to collect and drain away into said tank the liquid overflowing from said nip over said squeezer rollers and to prevent such liquid to reach the fabric below said squeezer rollers, upstream of said drum and external to said outer housing, an inlet spreading roller for the fabric, downstream of said drum and external to said housing an outlet spreading roller for said fabric, pumping means for supplying the scouring liquid to said spray members and drive means for rotating said drum.

4,135,374
BICYCLE LOCK

Adam H. Goral, R.R. #5, Lake Canton, Ill. 61520

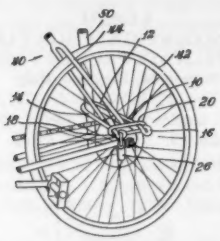
Filed Jan. 6, 1978, Ser. No. 867,519
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—18 **7 Claims**

1. A bicycle lock comprising:

a. a one piece, rigid, clevis having two legs meeting in a U-shaped curve, the first leg having a first eyelet integral therewith and disposed in a plane intersecting the plane defined by the said legs, and the second leg having a second eyelet integral therewith and disposed in the said plane defined by the said legs;

b. a one piece, rigid, closed link adapted to fit over the

eyelets and around the clevis for closing the open end of the clevis, and



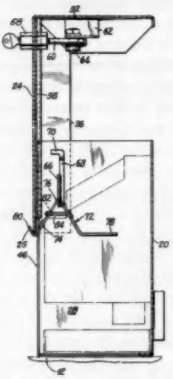
c. means passing through the second eyelet for securing the link on the second leg of the clevis, wherein the link is secured on the clevis by the first eyelet and the said means.

4,135,375

LOCKING MECHANISM FOR CABINET ENCLOSURE

Ronald C. Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed May 25, 1977, Ser. No. 800,394
Int. Cl.[2] B65D *43/20, 55/14;* **E05B** *65/00*
U.S. Cl. 70—77 **5 Claims**



1. In a cabinet enclosure defining a top wall and a plurality of upstanding side walls, and having closed and access configurations, one of said walls forming a panel that is slidably received by others of said walls, the improvement comprising a locking mechanism thereof, said mechanism comprising:

(a) locking means reciprocally captured for linear motion by said wall forming said panel, said locking means comprising a lock shaft member and a cooperating lock body member defining an aperture of variable dimension therebetween, said lock shaft member being fixedly attached to said panel, and said lock body member being reciprocally received through said panel;

(b) a latch support disposed interiorly of, and attached to, said enclosure, and fixed relative to said slidable panel; and

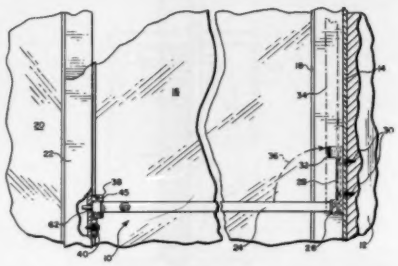
(c) fixed latching means attached to said latch support for cooperative engagement with said locking means, said latching means including hook means adapted to project through said aperture and to be captured by said lock body member when said enclosure is in a closed and locked configuration.

4,135,376

PATIO DOOR SECURITY BAR WITH LOCK

Arthur A. Evans, North Miami Beach, and Morton S. Rifkin, Hialeah, both of Fla., assignors to Charles Bar-Lok Corp., Glenwood, Ill.

Filed Jul. 11, 1977, Ser. No. 814,490
Int. Cl.[2] E05B *65/08*
U.S. Cl. 70—100 **14 Claims**



1. In a patio door or the like locking bar system in which a rigid bar is hingedly secured by one end thereof to a first vertical frame member of one of a framed glass panel and a framed opening in which the said panel slides, said bar adapted to be swung between a normally inoperative condition in vertical disposition alongside of said first vertical frame member to a horizontal position with the free end of the bar disposed at the second vertical frame member whereby the bar blocks the sliding movement of said panel, the invention herein which comprises,

A. at least the free end of the bar being hollow,

B. a sliding bolt in the bar end, said bolt having an elongate body including a slot formed therein defining two elongate facing walls and a rack formed along one of these elongated walls,

C. a rotary barrel in a lateral wall of the bar adjacent the end,

D. a motion-transmitting coupling between the barrel and bolt enabling rotary motion of the barrel to be converted into rectilinear sliding movement of the bolt within the hollow end of the bar, said coupling means including a pinion formed on the proximal end of the barrel and fitted in the slot and engaged with the rack and the proximal end of the barrel also engaging the other of the elongate slot walls to prevent the pinion from moving out of the rack,

E. the barrel having means for enabling the engagement of an actuating tool or the like therewith from exterior of the bar to rotate the barrel, the second vertical frame member adapted to have a bolt-receiving socket therein at the level which meets the bar when in said horizontal disposition whereby movement of the bolt into said socket will lock the bar in the horizontal disposition.

4,135,377

CENTRAL LOCKING EQUIPMENT FOR VEHICLE DOORS

Frank Kleefeldt, and Lothar Krause, both of Heiligenhaus, Fed. Rep. of Germany, assignors to Arn. Kiekert Sohne, Heiligenhaus, Fed. Rep. of Germany

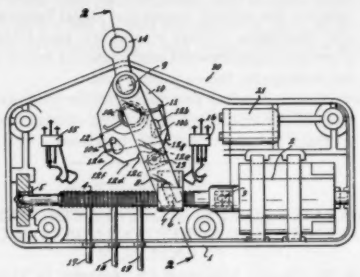
Filed Nov. 30, 1976, Ser. No. 746,222
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1975, 2553901; Mar. 31, 1976, 2613681
Int. Cl.[2] E05B *47/02, 65/36*
U.S. Cl. 70—264 **10 Claims**

1. In a system for locking the doors of a vehicle by central command, wherein each door includes a unit which includes a reversible motor operable under the central command, and a manually operable doorlock actuator including a lever, the improvement in such a unit and for each of the units of the system comprising:

a worm gear spindle connected to be driven by the motor;

a traveling unit on the spindle and moving axially on the spindle as the spindle is driven by the motor;

a bilaterally effective spring loaded, overload clutch for



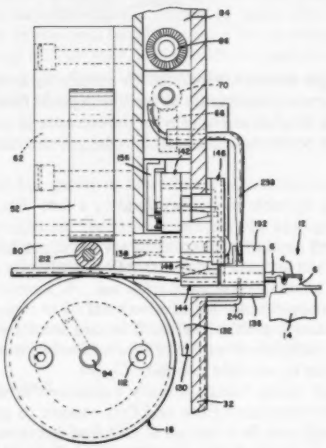
selectively coupling and uncoupling the traveling unit to the lever of the doorlock actuator, the motor driving the lever via the spindle and the nut upon coupling of the nut to the lever by the clutch.

4,135,378

WIRE FEEDING MEANS

Gary D. Balon, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 26, 1976, Ser. No. 745,331
Int. Cl.[2] B21D *43/02, 43/09*
U.S. Cl. 72—14 **3 Claims**



1. In combination with an apparatus having an operating zone and having a cyclically operating means in said zone for performing an operation, such as crimping a terminal, onto one end of a wire, feeding means for feeding a wire axially into said zone and positioning the end of said wire at a precise location in said zone, said feeding means comprising:

feed roll means, a stepping motor coupled to said feed roll means to drive said feed roll means and feed said wire along a feed path which extends towards said operating zone to said precise location, wire sensing means on said path for sensing the presence of the leading end of said wire during feeding of said wire, said wire sensing means being spaced from said predetermined location by a predetermined distance,

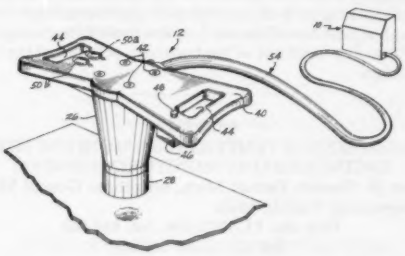
control means for said stepping motor, said control means comprising pulse generating means for generating a predetermined number of pulses for supply to said stepping motor for rotating said stepping motor by an amount sufficient to said feed wire from said sensing means to said predetermined location, counting means for counting pulses supplied to said motor, means responsive to said counting means for stopping said motor after said predetermined number of pulses have been supplied to said motor, selective switch means for selectively determining said predetermined number of pulses, and readiness indicating means responsive to said cyclically operating means, said readiness indicating means being effective to sense the readiness of said operating means to perform said operation and being effective to delay feeding of said wire to said predetermined location until said operating means completes a previous cycle of operation and is in a state of readiness to perform said operation.

4,135,379

PORTABLE HEAD FOR ELECTROMAGNETIC PULLING

Karl A. Hansen, and I. Glen Hendrickson, both of Seattle, Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Sep. 27, 1976, Ser. No. 726,872
Int. Cl.[2] B21D *26/02*
U.S. Cl. 72—56 **7 Claims**



1. A portable head for electromagnetic pulling of conductive materials wherein a flux concentrator first receives a slow rise high amplitude electrical current from a control panel followed by a fast rise lower amplitude electrical current flowing in the opposite direction to generate an attracting fore between the flux concentrator and the conductive material, and the portable head comprises: a snout having a flux concentrator, a handle for the snout having a dial to control amplitude of electrical currents to flow to the flux concentrators from capacitors and a cycle initiating firing button, means for transmitting control signals from the amplitude control dial and from the cycle initiating firing button in the handle to a control panel and means for transmitting a controlled signal from the control panel to the flux concentrator in the snout and the means for transmitting the signals includes a multi-conductor flexible cable and further comprising a flexible conductor inside the snout joined to multi-conductor ends of the flexible cable and then to terminals leading to the flux concentrator.

4,135,380

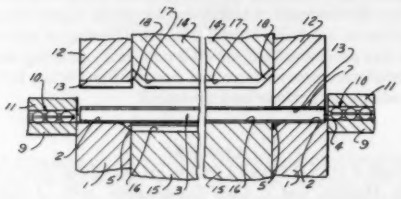
METHOD OF AND AN APPARATUS FOR MANUFACTURING ELONGATED CURVED TUBULAR ELEMENTS

Egon Olszewski, and Eckehard Hanert, both of Bollingen, Fed. Rep. of Germany, assignors to Benteler-Werke AG, Paderborn, Fed. Rep. of Germany

Filed Sep. 22, 1977, Ser. No. 835,533
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642743; Sep. 30, 1976, 2644030
Int. Cl.[2] B21D *7/06, 9/00*
U.S. Cl. 72—306 **27 Claims**

1. A method of manufacturing elongated curved tubular elements, comprising the steps of forming a straight elongated

tubular section; clamping the tubular section at longitudinally spaced end portions thereof; confining a central portion of the tubular section intermediate the clamped end portions thereof between two dies; applying forces to at least a respective one of the dies to displace the same and thus also the central portion of the tubular section in a predetermined direction and to a given extent with respect to the clamped end portions so that substantially S-shaped transitory portions of deformed cross-



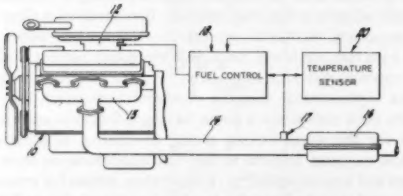
sectional shapes develop between the clamped end portions and the central portion of the tubular section; and restoring the cross-sectional shapes of the transitory portions of the tubular section preparatory to sequential retraction of the two dies and unclamping of the end portions of the tubular sections, including introducing at least one mandrel into the tubular section through at least one of the end portions thereof for passage into and through at least one of the transitory portions of the tubular section.

4,135,381

OXYGEN SENSOR TEMPERATURE MONITOR FOR AN ENGINE EXHAUST MONITORING SYSTEM

Walter M. Sherwin, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 11, 1977, Ser. No. 814,660
Int. Cl.[2] G01N *31/22*
U.S. Cl. 73—23 **2 Claims**



1. Temperature monitoring apparatus for use in a vehicle engine exhaust constituent monitoring system of the type including a sensor exposed to engine exhaust and effective to generate a voltage varying with the concentration of an exhaust constituent, the sensor further being characterized by an internal impedance varying with sensor temperature, and means responsive to the sensor voltage for generating an exhaust constituent signal therefrom, said means including low pass filter means characterized by a predetermined cutoff frequency for suppressing components of the sensor voltage having frequencies greater than said predetermined cutoff frequency, the apparatus comprising, in combination:

a capacitor;

a reference impedance coupled in series with the sensor and the capacitor therebetween to form a voltage divider with the sensor internal impedance, the voltage divider having an output between the reference impedance and sensor internal impedance;

means for generating an alternating voltage of constant peak-to-peak amplitude and a frequency greater than the predetermined cutoff frequency of the exhaust constituent signal generating means and applying the alternating voltage across the voltage divider, whereby the voltage divider produces at its output a modulated alternating voltage having a peak-to-peak amplitude varying with the sensor internal impedance and therefore providing an indication of sensor temperature and further having a frequency greater than the predetermined cutoff frequency, the exhaust constituent signal being isolated from the alternating voltage by the low pass filter means and from any superimposed unidirectional bias in the alternating voltage by the capacitor; and

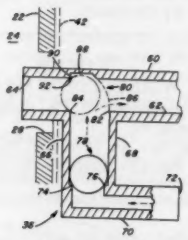
peak detector means responsive to the peak-to-peak amplitude of the modulated alternating voltage and generating a sensor temperature signal therefrom.

4,135,382

APPARATUS FOR DEVELOPING A COUNTERFLOW TO CLEAN A FLUID CONVEYING CONDUIT OF A GAS ANALYZER

David M. Capone, Oakmont, Pa., assignor to Thermo-Lab Instruments, Inc., Pittsburgh, Pa.

Filed Jan. 23, 1978, Ser. No. 871,489
Int. Cl.[2] G05D *9/00*; G01N *27/00*
U.S. Cl. 73—23 **10 Claims**



1. In a gas analyzer, apparatus for developing a counterflow in a fluid conveying conduit to remove deposits from the inner wall of the conduit and to prevent the entrance of an explosive mixture of combustible material into the gas analyzer comprising,

a first conduit having an inlet and an outlet, said first conduit being operable to convey fluid in a first direction from said inlet to said outlet,

a second conduit connected to said first conduit between said inlet and said outlet of said first conduit for conveying fluid to said first conduit,

said first conduit having a valve seat,

stop means movably positioned in said second conduit for controlling the direction of flow of fluid from said second conduit to said first conduit,

said stop means being normally maintained in said second conduit displaced from said first conduit to permit flow through said first conduit in said first direction, and

said stop means being operable upon flow through said second conduit to move from said second conduit to said first conduit into sealing relation with said valve seat to block flow from said inlet to said outlet of said first conduit and direct flow from said second conduit to said first conduit and through said first conduit in a direction opposite to said first direction of flow through said first conduit.

4,135,383

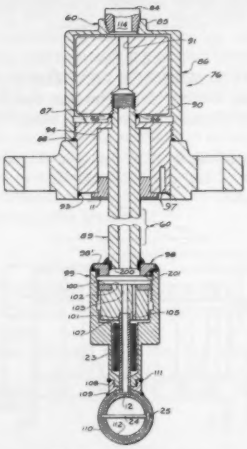
VIBRATION DENSITOMETER PROBE

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,030
Int. Cl.[2] G01N *9/00*
U.S. Cl. 73—32 A **2 Claims**

1. In vibration densitometer apparatus, the combination

comprising: a pipeline having a flow path; a vibration densitometer probe having an end; means including a hollow shaft in said pipeline for providing a fluid tight mount on said pipeline for said probe, said mount holding said probe in a position such that said probe end extends into said flow path, said probe hanging from said hollow shaft, said probe including a ferrule,



said ferrule including an annular body having a hole therethrough, said hollow shaft extending at least part way into said hole, and a cup-shaped body having an upper rim extending around said ferrule, said ferrule having a flange extending over said rim, said hollow shaft being welded to said ferrule by a weld material, said ferrule being welded to said rim by a weld material, both of said welds being fluid tight.

4,135,384

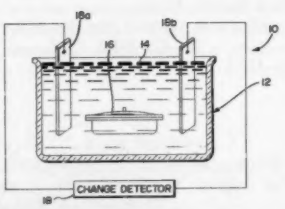
METHOD OF DETERMINING ELECTROLYTE LEAKAGE IN HERMETICALLY SEALED ELECTROCHEMICAL CELL

Anson C. Burwell, Jr., and John J. Decker, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 727,770, Sep. 29, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 850,017

Int. Cl.[2] G01M *3/16*

U.S. Cl. 73—40.7 **6 Claims**



1. In a method of non-destructively determining the presence or absence of electrolyte leakage in a hermetically sealed primary electrochemical cell the steps comprising: immersing said cell in a dielectric liquid medium which is sensitive to the presence of said electrolyte or components of said electrolyte, said liquid having a temperature greater than the boiling point of said electrolyte; and monitoring said liquid medium for changes therein caused by said electrolyte or said components thereof.

4,135,385

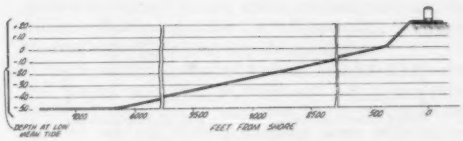
METHOD OF DETERMINING THE LOCATION OF UNDERWATER PIPELINE LEAKS

John H. Watkins, San Dimas, Calif., assignor to Southern California Edison Company, Rosemead, Calif.

Filed Aug. 26, 1976, Ser. No. 717,570

Int. Cl.[2] G01M *3/28*

U.S. Cl. 73—40.5 R **5 Claims**



1. A method for determining the location of a leak in an underwater pipeline containing a stagnant liquid having a specific gravity different from that of water, comprising the steps of:

measuring the pressure inside said pipeline after the formation of the leak;

determining the depth of the pipeline at the site of the leak;

locating the position of the leak in said pipeline by reference to a chart of the profile of the pipeline.

4,135,386

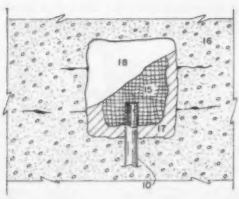
POROUS MATERIAL CRACK DETECTION

Marvin L. Peterson, and Donald H. Oertle, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 27, 1977, Ser. No. 864,575

Int. Cl.[2] G01N *19/06*

U.S. Cl. 73—40 **27 Claims**



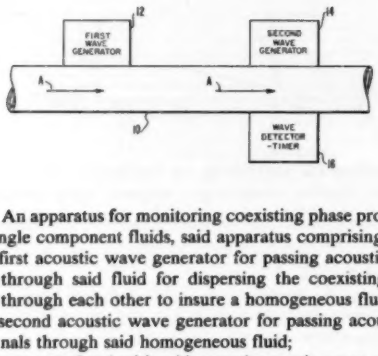
1. A method for monitoring early formation of cracks in permeable materials comprising (a) affixing a frangible, fluid impermeable enclosure to the permeable surface to be monitored such that a crack forming in the permeable material will destroy the integrity of the frangible, fluid impermeable enclosure and provide a passage for a fluid to flow between the environment and the enclosed space, (b) sealing a fluid passageway in fluid communication from the enclosure to a source of pressure different than ambient at the permeable material and to a pressure sensor, (c) imparting pressure different than ambient to the enclosure in the fluid passageway, and (d) monitoring the internal pressure in the enclosure and fluid passageway with the pressure sensor, such that a crack in the permeable material will destroy the integrity of the enclosure and allow passage of fluid between the environment and the enclosure and wherein the pressure change is detected by the pressure sensor.

4,135,387

DEVICE FOR MONITORING PHASE PROPORTIONS OF A SINGLE COMPONENT FLUID

Robert P. Benedict, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,483
Int. Cl.² G01N *29/02*
U.S. Cl. 73—53 **1 Claim**



1. An apparatus for monitoring coexisting phase proportions in single component fluids, said apparatus comprising:

a first acoustic wave generator for passing acoustic signals through said fluid for dispersing the coexisting phases through each other to insure a homogeneous fluid; and

a second acoustic wave generator for passing acoustic signals through said homogeneous fluid;

means associated with said second acoustic wave generator for detecting waves generated thereby; and

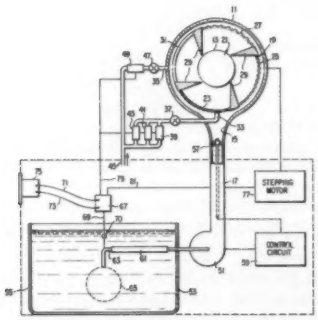
means for timing the traversal of the waves generated by said second acoustic wave generator from the second acoustic wave generator to the detecting means.

4,135,388

METHOD AND APPARATUS FOR AUTOMATICALLY FRACTIONATING A SAMPLE OF PARTICULATE MATERIAL INTO DISCRETE SIZE FRACTIONS

Clyde Orr, Jr., Dunwoody, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Filed Oct. 31, 1977, Ser. No. 847,087
Int. Cl.² G01N *15/02*
U.S. Cl. 73—61.4 **6 Claims**



1. Apparatus for automatically determining the relative weight proportions of differently sized fractions of a sample of particulate material, comprising:

a casing having an inlet opening at an upper region thereof and a discharge outlet at a lower region thereof;

a tumbler rotatably mounted within the casing, the tumbler having at least one screen member and one open space around its periphery bordered by inwardly extending dividers for dividing the interior of the tumbler into a plurality of compartments, each compartment leading from the inlet opening into the discharge outlet when the respective screen member is aligned with the discharge outlet;

means for selectively introducing fluid into the compartments to selectively discharge particulate material retained in the compartments;

means for sequentially accumulating particulate material discharged from the several compartments; and

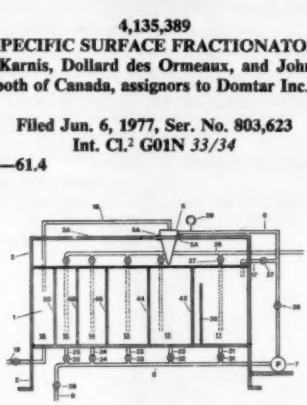
means for weighing the contents of the accumulating means.

4,135,389

SPECIFIC SURFACE FRACTIONATOR

Alkibiadis Karnis, Dollard des Ormeaux, and John R. Wood, Dorion, both of Canada, assignors to Domtar Inc., Montreal, Canada

Filed Jun. 6, 1977, Ser. No. 803,623
Int. Cl.² G01N *33/34*
U.S. Cl. 73—61.4 **10 Claims**



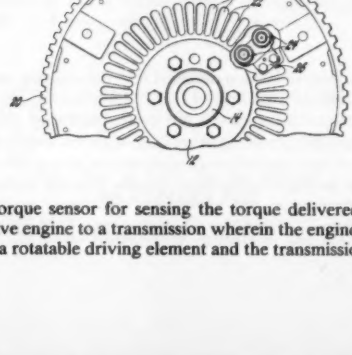
1. An apparatus for use in determining the fractional distribution by weight of fibre specific surface in a sample of mechanically treated pulp comprising; hydrocyclone means having overflow and underflow outlets, at least two separate collecting chambers, means for agitating pulp in each of said chambers, feeding means for feeding pulp to said hydrocyclone means, means to selectively connect each one of said chambers to said feeding means to feed pulp from a selected one of said chambers to said hydrocyclone means, means for selectively connecting each of said chambers to a selected one or both of said overflow or underflow outlets thereby to collect one after another a separate fraction of said pulp in each of said chambers and to feed one after another each of said collected fractions to said hydrocyclone means, means for measuring the amount of pulp fed to said hydrocyclone means, and means for measuring the amount of each said separate pulp fractions.

4,135,390

ENGINE TORQUE TRANSDUCER USING A SPOKED TORQUE TRANSMITTING PLATE

Jackson R. Templin, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1978, Ser. No. 877,100
Int. Cl.² G01L *3/14*
U.S. Cl. 73—136 C **7 Claims**



1. A torque sensor for sensing the torque delivered by an automotive engine to a transmission wherein the engine output includes a rotatable driving element and the transmission input

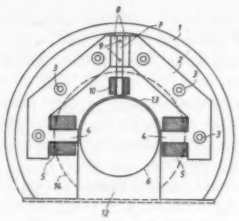
includes a rotatable driven element, comprising; a generally disc-shaped torque transmitting plate formed of resilient material for transmitting torque between said driving and driven elements, said plate having an inner hub portion connected to one of said elements and a circumferential portion connected with the other of said elements, an arcuate array of spaced slots formed in said plate concentrically with said hub portion, the slots defining therebetween resilient torque transmitting spokes interconnecting said hub portion and said circumferential portion for transmitting torque between said driving and driven elements, said spokes being subject to being flexed by an amount which is a function of the torque being transmitted between said driving and driven elements so as to assume a canted relationship to their unflexed orientations, and detector means effective during plate rotation to produce an electrical output responsive to the passage of spaced portions of the resilient spokes past the detector means, the electrical output varying in accordance with spoke flexure caused by the torque transmitted through the spokes.

4,135,391

TORQUE TRANSDUCER

Orvar Dahle, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Nov. 22, 1977, Ser. No. 853,871
Int. Cl.[2] G01L *3/10*
U.S. Cl. 73—136 A **5 Claims**



1. Torque transducer preferably intended for measuring the torque in the outgoing crankshaft of automobile engines and comprising two two-pole magnetic cores, arranged perpendicular to each other, with coils around the poles, of which one core, the primary core, with coils is arranged to be supplied with alternating current for generation of a magnetic alternating field in the surface of the shaft and the second core, the secondary core, with coils is arranged for sensing the changes in said alternating field which are caused by the applied torque, in which the poles of the primary core are located right in front of diametrically opposite points on the crankshaft, whereby the time for magnetic stress measurement over the entire circumference of the shaft is reduced to one half compared with the corresponding measuring time in case of a primary pole distance comprising only a small part of the circumference of the shaft.

4,135,392

EQUIPMENT MOUNTING AND MONITORING SYSTEM

Sheldon E. Young, Western Springs, Ill., assignor to Vibro/Dynamics Corporation, LaGrange, Ill.

Continuation-in-part of Ser. No. 652,203, Jan. 26, 1976, Pat. No. 4,047,427, and a continuation-in-part of Ser. No. 679,938, Apr. 26, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,431
Int. Cl.[2] G01L *5/00*
U.S. Cl. 73—141 A **7 Claims**

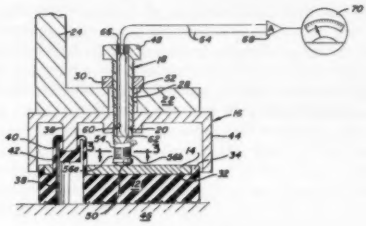
1. An improved, adjustable, load and force transferring component interposable in a machinery mount between a bearing member supported on a compressible, resilient base and a machinery supporting member wherein said component comprises a substantially cylindrical metallic body having integral first, second, third and fourth portions and wherein;

said first portion is adjacent one end of said body and engageable by suitable means for precisely controlled axial rotation of said body in alternate directions;

said second portion comprises a protrusion at the opposite end of said body adapted to be supported in bearing relation on a planar portion of said bearing member;

said third portion extends from adjacent said first portion toward said second portion and is externally threaded for axially rotatable engagement in a cooperating, internally threaded opening in said supporting member;

said fourth portion comprises a shank interposed between said second and third portions and has a precision-machined peripheral surface, said fourth portion being minutely and uniformly deformable when subjected to



axial forces exerted upon said body between said second and third portions;

a strain gauge secured to the peripheral surface of said fourth portion;

a substantially axial passage within said body, substantially coextensive with said third portion;

a first opening extending substantially radially from said passage to the exterior of said body adjacent said fourth portion;

a second opening extending from said passage to the exterior of said body adjacent said first portion; and

a plurality of lead wires electrically connected to said strain gauge and extending therefrom through said first opening and said passage to said second opening for connection to a source of electrical current and to suitably calibrated read-out means.

4,135,393

TENSIOMETER

Donald J. Jordan, 113 Evergreen La., Glastonbury, Conn. 06033

Filed Feb. 14, 1978, Ser. No. 876,921
Int. Cl.[2] G01L *5/06*
U.S. Cl. 73—144 **11 Claims**

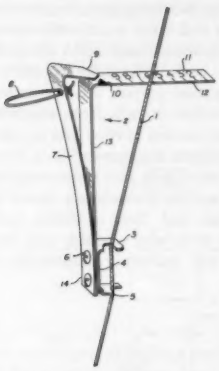
1. A tensiometer for measuring the tension of an elongated flexible article such as cable, wire, belts or strapping comprising:

fulcrum means for providing a place about which said elongated flexible article can bend;

means for applying a predetermined force to said fulcrum means, the force capable of deflecting the elongated flexible article; and

scale means associated with said fulcrum means to measure

the deflection of said elongated flexible article with respect to the fulcrum means, said elongated flexible article



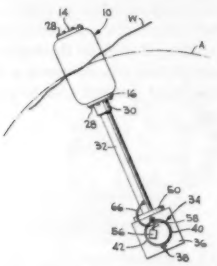
defining a movable output member which cooperates with said scale means to provide a reading.

4,135,394

WAVE MEASURING BUOY

Foster H. Middleton, Curtis Corner Rd., Peace Dale, R.I. 02879, and Lester R. LeBlanc, 80 Highland Ave., Narragansett, R.I. 02882

Filed Apr. 27, 1977, Ser. No. 791,181
Int. Cl.² G01P *15/00*
U.S. Cl. 73—170 A **6 Claims**



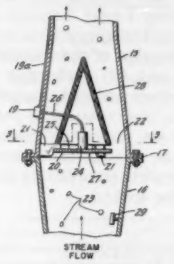
1. A wave measuring buoy assembly capable of being launched and retrieved from a small boat and which when launched tends to follow the wave surface and in the course of following a wave surface tends to pitch and roll, said assembly comprising a flotation hull and a rigid underwater assembly depending therefrom, said underwater assembly having a greater horizontal drag than said hull, said underwater assembly comprising a water-proof housing and means fixing said housing to said hull and spaced therebelow, said hull being adapted to support said underwater assembly therebeneath in a body of water, said housing being spaced below said flotation hull a distance such that as the buoy assembly rolls or pitches under the influence of wave motion it stabilizes itself by acting as an inverted pendulum, the center of rotation of which is said housing, an accelerometer suspended in said housing for pivotal motion relative thereto, and means to process the output of said accelerometer.

4,135,395

UNDERSEA MINING INSTRUMENT

Arthur F. Sullivan, Redmond, and William E. Currie, Seattle, both of Wash., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 26, 1977, Ser. No. 845,548
Int. Cl.² G01F *1/28*
U.S. Cl. 73—194 B **10 Claims**



1. Apparatus for metering the flow of solid articles entrained in a moving fluid-solids mixture comprising:

(a) a conduit having a fluid-impermeable interior wall for enclosing a fluid-solid flow of a mixture of fluid and solid articles moving in a forward direction when proceeding from the conduit entrance to the conduit exit;

(b) a target supported inside the conduit and disposed with a surface of the target transversely facing the forward direction of fluid-solids flow in the conduit and arranged, in correlation with the interior wall of the conduit, to receive mechanical impacts by solid minerals in fluid-solids flow moving forwardly in the conduit and to provide passage space for continual flow of fluid and solids through the conduit;

(c) an electromechanical impact sensor joined to the target in an arrangement for generating a voltage pulse signal of major magnitude when mechanically impacted by a solid article moving in a direction parallel to the forward flow direction, said signal of major magnitude being characterized by a peak voltage greater than would result from impact by the same solid article moving at an angle transverse to the forward direction; and

(d) electric circuit means for receiving electric signals from the sensor and providing, in response thereto, a digital output signal informative of the number of solid articles that impact upon the target at a chosen moment or during a preselected time interval.

4,135,396

TEMPERATURE COMPENSATING FLUID VELOCITY SENSING APPARATUS

Dennis A. Stanke, La Crescent, Minn.; Paul C. Rentmeester, La Crosse, Wis., and Paul D. Ulland, La Crescent, Minn., assignors to The Trane Company, La Crosse, Wis.

Filed Apr. 24, 1978, Ser. No. 899,628
Int. Cl.² G01F *1/68*
U.S. Cl. 73—204 **13 Claims**

1. Apparatus for sensing the velocity of a variable temperature fluid stream comprising

a. first probe means including first temperature sensing means for sensing the temperature of said fluid and producing a first signal related thereto;

b. second probe means including at least a portion constructed of thermally conductive material to be disposed in said fluid stream, said probe means including

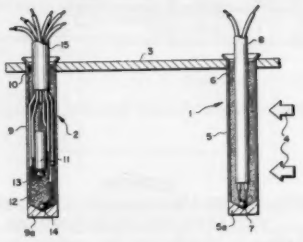
i. heater means disposed in thermally conductive relationship with the thermally conductive portion of said second probe means;

ii. second temperature sensing means for sensing a temper-

ature indicative of the temperature of said heater means and for producing a second signal related thereto; and

iii. third temperature sensing means for sensing the temperature of the thermally conductive portion of said second probe means at a point removed from said heater means and for producing a third signal related thereto;

c. heater control circuit means for receiving said first and second signals and for controlling the heat output of said



heater means so as to maintain substantially constant the temperature difference betweeen said fluid stream and said heater means; and

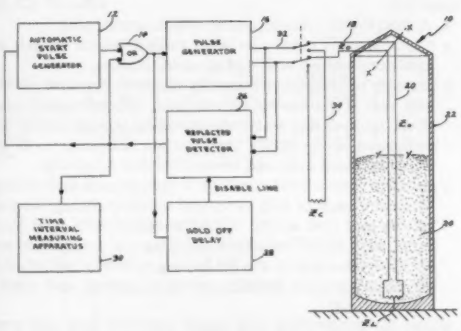
d. velocity output circuit means for receiving said first and third signals and for producing a fourth signal related to the difference between the temperature of said fluid and the temperature of said second probe means at said point removed from said heater means, said fourth signal being related to the velocity of said fluid stream.

4,135,397

LEVEL MEASURING SYSTEM

Guss L. Krake, 6939 Harriet Ave. S., Minneapolis, Minn. 55423

Filed Jun. 3, 1977, Ser. No. 803,226
Int. Cl.[2] G01F *23/28*
U.S. Cl. 73—290 R **9 Claims**



1. A measuring system for determining the height of a material in a container comprising:

a. container means for storing a material, a high impedance transmission line means supported in said container means, and load impedance means terminating one end of said high impedance transmission line means;

b. feed line means connected to the other end of said high impedance transmission line means;

c. pulse generator means connected to feed line means to generate a train of incident pulses which propagate an external electromagnetic field surrounding said high impedance transmission line means;

d. reflected pulse detector means connected to said feed line means to receive reflected pulses of opposite polarity of said incident pulses from said high impedance transmission line means occurring at an interface of the air and said material in said container means;

e. trigger means connected to said pulse generator means and triggered by each of said reflected pulses from said reflected pulse detector means;

f. start pulse generator means connected to said trigger means;

g. hold off delay means connected between said pulse generator means and said reflected pulse detector means; and,

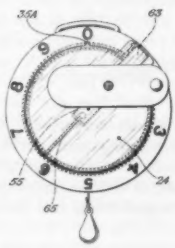
h. time interval measuring means connected to said reflected pulse detector means whereby said start pulse generator means triggers said pulse generator means through said trigger means to generate train of incident pulses down said high impedance transmission line means to subsequently propagate an external electromagnetic field surrounding said transmission line means, said hold off delay means disables said reflected pulse detector means during the time of travel of each of said incident pulses from said pulse generator means to a junction of said feed line means and said high impedance transmission line means and time of travel of each of said reflected pulses from said junction to said reflected pulse detector means so that said reflected pulse detector means is not triggered by noise signals during said time of travel, and said time interval measuring means measures the time between said incident pulse and said reflected pulse occurring at the interface of the air and said material in said container, said time interval being directly proportional to said height of said material in said container.

4,135,398

DEPTH GAUGE AND POSITION MARKING DEVICE

George F. Horton, Rte. 2, Box 718, Fort Worth, Tex. 76135

Filed May 25, 1977, Ser. No. 800,342
Int. Cl.[2] G01F *23/06*
U.S. Cl. 73—305 **16 Claims**



1. A depth indicator for determining the depth of a body of water, comprising:

base means, scale means supported for rotation with respect to said base means,

float means coupled to said base means for supporting said base means in the water with a portion of said scale means supported above the surface of the water and with its axis of rotation generally horizontal,

spool means supported for rotation by said base means,

a flexible line wound around said spool means and having weight means attached to its free end,

said weight means being capable of unreeling said line from said spool means as it sinks in the body of water, and

drive means coupled between said spool means and said scale means and responsive to the rotation of said spool means for rotating said scale means an amount which is a function of the length of line unreeled from said spool means as said weight means sinks in the body of water,

said scale means comprising an annular member,

teeth means formed 360 degrees around said annular member,

said drive means comprising,

shaft means secured to said spool means for rotation therewith.

reciprocating means having teeth means at a first end adapted to engage said teeth means of said annular member, and

cam means secured to said shaft means for rotation therewith for reciprocating said reciprocating means in a given direction for moving its teeth means into and out of engagement with said teeth means of said annular member,

said cam means also being employed for moving said reciprocating means in a direction generally transverse to said given direction when said teeth means of said reciprocating means is in engagement with said teeth means of said annular member to cause incremental rotation thereof.

4,135,399

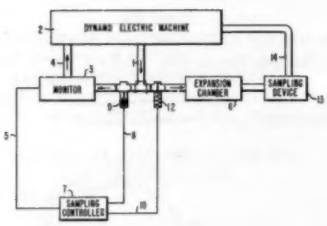
USE OF AN EXPANSION CHAMBER FOR THE PRODUCTION OF REPRESENTATIVE PARTICULATE EFFLUENT FROM POLYMERS

Thomas D. Kaczmarek, Penn Hills, and Richard J. Wengrzyn, Edgewood, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 13, 1977, Ser. No. 796,576

Int. Cl.[2] G01K *3/00*; G08B *21/00*

U.S. Cl. 73—339 R **5 Claims**



1. A sampling system comprising:

a gas stream monitoring means for detecting thermal degradation of materials by monitoring the gas stream exposed to the products of said thermal degradation, and for generating a first signal when said thermal degradation is detected;

means for determining whether said gas stream monitoring means is functioning properly when said first signal is generated and if so, for generating a second signal;

a sampling means for sampling said gas stream when said second signal is generated; and

a gas expansion means for increased production of aerosol-type condensates disposed between said sampling means and said gas stream.

4,135,400

ELECTRONIC THERMOGRAPH

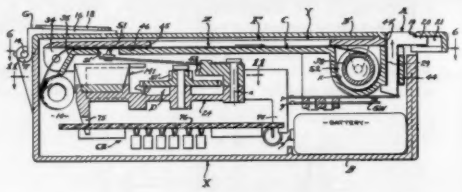
William H. Maxwell, and Harvey J. Sines, both of Los Angeles, Calif., assignors to Time & Temperature Company, Los Angeles, Calif.

Filed Dec. 2, 1976, Ser. No. 747,013

Int. Cl.[2] G01K *1/02, 5/70*

U.S. Cl. 73—343.5 **27 Claims**

1. The combination of an expendable container and reuseable thermograph with a replaceable chart to be recorded upon; the thermograph including a chassis over which the chart is transported onto a take-up spool by drive means carried by the chassis, and thermometer means carried by the chassis and having a recording stylus to engage the chart; and the container including a box to receive the chassis and a cover enclosing the thermograph and chart within the box, and thermograph actuating means having a destructably removable cover securement element installed through the box and cover.



4,135,401

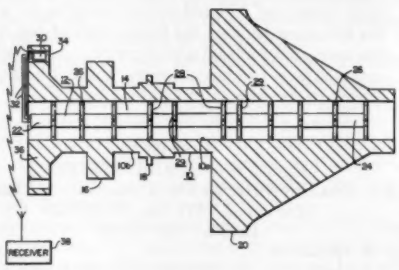
TEMPERATURE MEASUREMENT SYSTEM FOR HOLLOW SHAFT INTERIORS

Albert F. LeBreton, Middletown, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1977, Ser. No. 853,939

Int. Cl.[2] G01K *13/08, 1/14*

U.S. Cl. 73—351 **6 Claims**



1. A temperature measurement system comprising:

a rotatable shaft having an inner surface which bounds an axially extending void and an outer surface;

a plurality of temperature sensing elements disposed within said void at predetermined axial and circumferential locations, said sensing elements providing signals which are indicative of the shaft's inner surface temperature at the predetermined axial and circumferential locations;

a plurality of structural members which support said sensing elements, each of said structural members being situated within said void at one of said predetermined axial locations, each of said members including a plurality of structural sections and means for biasing at least a part of each structural section radially outward against said shaft's inner surface;

means for transmitting said signals received from said sensing elements; and

means for monitoring said transmitted signals.

4,135,402

THERMOCOUPLE TEMPERATURE DETECTING ASSEMBLY

Hisato Wakamatsu, Toyota, and Akio Yazawa, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Aug. 10, 1977, Ser. No. 823,456

Claims priority, application Japan, Aug. 25, 1976, 51-114384[U]

Int. Cl.[2] G01K *7/12*

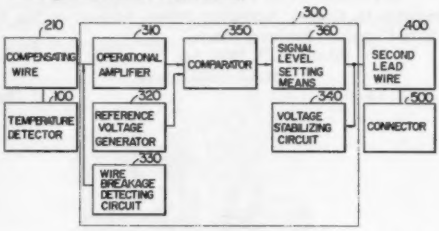
U.S. Cl. 73—361 **7 Claims**

5. A thermocouple temperature detecting assembly comprising:

thermocouple means for generating a detection voltage due to the thermoelectric effect thereof;

first lead wire means electrically connected to said thermocouple means for transmitting said detection voltage;

amplifier means electrically connected to said first lead wire means for amplifying said detection voltage transmitted through first lead wire means;



casing means encasing said thermocouple means, said first lead wire means and said amplifier means therein; and

second lead wire means extending from said casing means for transmitting an electric signal corresponding to the amplified detection voltage from inside to outside said casing.

4,135,403

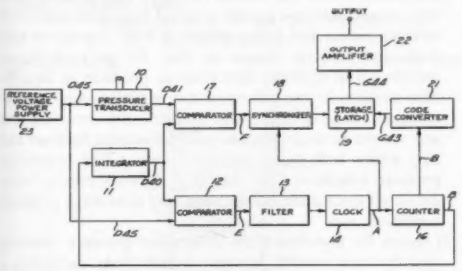
ELECTRONIC ALTITUDE ENCODER

Thomas Skarvada, Woodland Hills, Calif., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed May 25, 1977, Ser. No. 800,443

Int. Cl.[2] G01L *7/00*; G01C *21/00*

U.S. Cl. 73—384 **15 Claims**



1. An altitude measuring device comprising

pressure transducer means for providing an output signal which is a function of the barometric pressure at the altitude sought to be measured;

integrator means for providing a waveform which represents a curve of altitude as a function of barometric pressure, and

comparator means having one input coupled to the output of said pressure transducer means and a second input coupled to said integrator means, said comparator means being operative to provide a transition of its input when the output signal provided by said pressure transducer means intersects the waveform provided by said integrator means, whereby the point of time of the transition of the output is a function of the altitude sought to be measured.

4,135,404

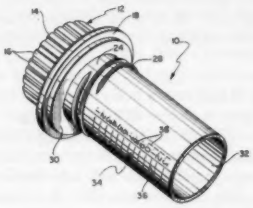
GAS TANK MEASURING AND CLOSURE DEVICE

Edward J. Butler, Jr., Butler Chevrolet Motors, 452 Broad St., New London, Conn. 06320

Filed Feb. 6, 1978, Ser. No. 875,748

Int. Cl.[2] G01F *19/00*

U.S. Cl. 73—426 **5 Claims**



1. In combination with the fuel tank of a vehicle having an engine requiring an additive to the fuel, portions of said tank defining a fill opening therein, a device adapted for alternative closure and measuring use positions with said tank, said device including a cap member adapted to engage said tank portions so as to close said opening therein and further having an upper portion adapted to extend outwardly of said tank when said device is disposed in said closure position, an elongated hollow tubular member downwardly projecting from a lower surface of said cap member when said device is disposed in said closure use position, said tubular member having a container portion adapted to receive and measure said additive in proportion to fuel being added when said device is removed from said tank in its measuring use position, and said cap member forming a holding member for said device for enabling a user thereof to hand manipulate said device in both of said alternative use positions thereof, said tubular member being a cylinder, said upper cap portion being of cylindrical shape having an indented outer peripheral surface, said device including a flange radially extending from said cap, said flange including means for sealingly engaging said portions of said tank defining said opening, outer portions of said cylinder proximal to said cap including thread means for connecting said device to said tank and lower portions of said cap when said device is in its closure use position extending into said cylinder so as to space said cylinder container portion from other portions of said cap.

4,135,405

ROTATION DISPLAYING DEVICE

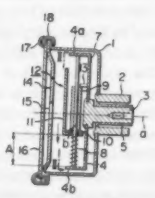
Junji Fukuyo; Chiharu Kanbe; Yasuaki Ohike, and Tuneji Oguri, all of Shimada, Japan, assignors to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,619

Claims priority, application Japan, May 6, 1976, 51-56125[U]; May 24, 1976, 51-65341[U]; May 24, 1976, 51-59082[U]

Int. Cl.[2] G01P *3/18*

U.S. Cl. 73—499 **2 Claims**



1. A rotation displaying device comprising a rotary shaft to

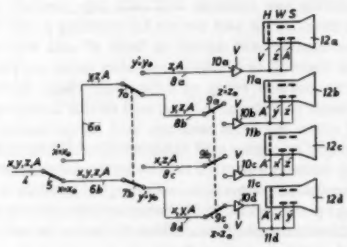
be rotated at a speed proportional to the rotating speed of a rotary body such as an engine, a rod supported by and extending between end lugs on a rotary plate mounted on one end of said rotary shaft to extend in orthogonal relation to the axis of said rotary shaft, a color pattern plate mounted slidably on said rod through spring means to have sliding movement along said rod by being urged radially outwardly by the centrifugal force produced as a result of rotation of said rotary shaft, and a display plate disposed in parallel to said color pattern plate and having a single central opening therein, said color pattern plate being provided on its surface with a pattern of three different colors in different radial positions on such pattern plate and representing a first speed, a second speed and a third speed respectively of said rotary body, whereby the rotating speed of said rotary body is displayed by the change in the color pattern viewed through said single central opening of said display plate, said color pattern plate being mounted on a tube that is in slidable engagement with said rod and is slidable together with a balancing member as a unit along said rod to indicate speed, and said color pattern plate being in the form of an L-shaped member which is fixed to said tube with its long arm extending parallel to said rod and with its short arm slidably and rotatably engaging said tube and extending towards and terminating adjacent said rotary plate to limit arcuate movement of said color pattern plate in relation to said rotary plate.

4,135,406

METHOD FOR ULTRASONIC EXAMINATION

Carl Kretz, Zipf, Austria, assignor to Kretztechnik Gesellschaft m.b.H., Zipf, Austria

Filed Mar. 25, 1977, Ser. No. 781,334
Claims priority, application Austria, Apr. 8, 1976, 2564/76
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—620 **9 Claims**



1. An ultrasonic method of examining an object, comprising

(a) moving a sound transducer head means over the object,

(b) directing an ultrasonic beam of pulses from the transducer head means into a three-dimensional region of the object to scan the region with the pulses,

(c) receiving echo pulses originating from the scanned region in the transducer head means and generating therefrom output signals corresponding to the echo pulses,

(d) connecting a logic circuit to the transducer head means to receive the output signals,

(1) the logic circuit selecting at least two sectional planes and the line of intersection of the sectional planes in the scanned region, independently of the surface of the object, the direction of the ultra-sonic beam and the movement of the transducer head means, and transmitting only those output signals corresponding to the echo pulses emanating from the selected sectional planes or from one sectional plane and a selected line or lines of intersection of the selected sectional planes, and

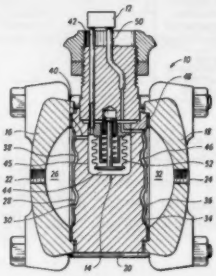
(e) receiving the separately transmitted signals at points of a picture screen geometrically corresponding to the geometric points whence the echo pulses originate in the scanned region to obtain simultaneously from each one of the selected planes or lines a separate corresponding picture on the screen and to show each line of intersection.

4,135,407

METHOD AND APPARATUS FOR OVERRANGE PROTECTION OF THE TRANSDUCER IN A DIFFERENTIAL PRESSURE TRANSMITTER

Frederick D. Ezekiel, Lexington, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Apr. 3, 1978, Ser. No. 892,811
Int. Cl.[2] G01L *9/00*
U.S. Cl. 73—717 **17 Claims**



1. An overrange pressure protection apparatus for a differential pressure transmitter having a transducer for producing an electrical output signal that is a function of the pressure differential applied thereacross, said overrange pressure protection apparatus comprising:

(1) a housing having a central cavity with inlet means for applying a first and a second pressure signal across the transducer;

(2) a bidirectionally deflectable, preloaded bellows means positioned within the central cavity of said housing and interposed between said first and second pressure signals;

(3) a unidirectionally deflectable, preloaded stop means positioned within the central cavity of said housing, said stop means having a greater preload than said preloaded bellows means and being mounted with respect to said preloaded bellows means so that the preload forces therein act in opposite directions to produce an equilibrium position for the bellows and stop means over a predetermined range of differential pressures between said first and second pressure signals, said deflectable bellows and stop means both being deflected upon a first overrange pressure condition and only said bellows means being deflected upon a second and opposite overrange pressure condition; and,

(4) means for preventing the differential pressure between said first and second pressure signals from exceeding a predetermined differential pressure.

4,135,408

DIFFERENTIAL PRESSURE MEASURING TRANSDUCER ASSEMBLY

Mario Di Giovanni, Pacific Palisades, Calif., assignor to ICT Instruments, Inc., Los Angeles, Calif.

Continuation of Ser. No. 670,033, Mar. 24, 1976, abandoned.
This application Jun. 15, 1977, Ser. No. 806,794
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—721 **17 Claims**

1. A differential pressure measuring transducer assembly comprising:

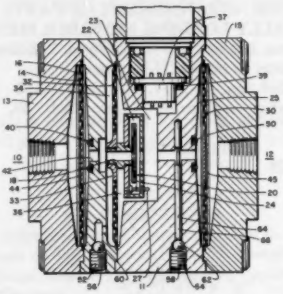
a housing having a flexible partition mounted on and extending radially to the wall of said housing, said flexible partition comprising a substantially planar corrugated diaphragm having a center mounting hub;

a pair of isolation diaphragms enclosing substantially equal volume of fluids on each side of said partition;

pressure-responsive transducer means mounted on the center hub of said partition for producing an electrical output responsive to the difference in pressure on said isolation diaphragms, said pressure-responsive transducer means comprising:

a transducer chip,

a supporting constraint plate attached to said transducer chip at the periphery,



said constraint plate being of the same material as said transducer chip,

means for attaching said constraint plate to said center hub of the flexible partition,

said isolation diaphragms including valve means for shutting off the flow of fluid to said flexible partition thus affording a pressure overflow protective stop, spaced from and independent of said transducer means and its supporting partition.

4,135,409

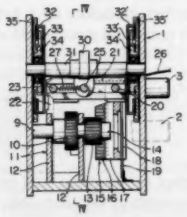
DEVICE FOR CONVERTING ROCKING MOTION INTO RECIPROCATING ROTARY MOTION

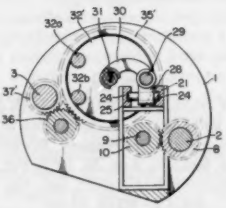
Rakuichi Ishimaru, 2-9-12, Uyina-Higashi, Hiroshima-shi, Hiroshima-ken, Japan

Filed Mar. 9, 1977, Ser. No. 775,851

Int. Cl.[2] F16H *21/40*

U.S. Cl. 74—76 **3 Claims**





1. A device for converting a rocking motion into a reciprocating rotary motion comprising a rocking rod having one end thereof pivotally supported and the other end thereof rockably disposed, means to drive said rocking rod in a rocking motion, a sliding part provided on said rocking rod and freely movable longitudinally along said rod, a rotating shaft the longitudinal axis of which generally parallels the longitudinal axis of said rocking rod, and a rocker arm having one end thereof pivotally mounted on said sliding part and the other end thereof coupled to said rotating shaft and freely movable longitudinally along said rotating shaft, the rocking motion of said rocking rod being transmitted to said rotating shaft through said rocker arm so as to reciprocatedly rotate said rotating shaft with the amount of rotation of said rotating shaft produced by each rocking of said rocking rod being adjustable by shifting said sliding part along said rocking rod.

4,135,410

INERTIAL LOCKING DEVICE

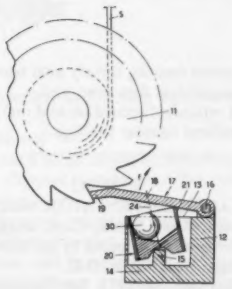
René G. Filderman, Asnieres, France, assignor to Societe Anonyme Francaise du Ferdo, Paris, France

Filed Aug. 3, 1977, Ser. No. 821,356

Claims priority, application France, Aug. 10, 1976, 76 24397; Dec. 27, 1976, 76 39181

Int. Cl.[2] F16H *57/10*

U.S. Cl. 74—411.5 **14 Claims**



1. An inertia device for blocking the rotation of a shaft with a ratchet when said device is subjected to a destabilizing force, said device comprising:

a pivoting ratchet;

a gear means attached to the end of said shaft;

means for activating said ratchet such that it coacts with the gear means to block movement of the gear means;

said activating means comprising a holder containing an inertia mass; said inertia mass being arranged within said holder such that in the event the device is subjected to a destabilizing force, the holder is tilted by virtue of the displacement of the center of gravity of the holder-inertia mass combination and as a result, the pivotable ratchet is brought into engagement with said gear means by said holder.

4,135,411

GEAR TRANSMISSION

Lorenzo E. Alessio, Cairoli, Italy, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Dec. 5, 1977, Ser. No. 857,607

Claims priority, application Italy, Dec. 3, 1976, 30117 A/76

Int. Cl.[2] F16H *1/14, 1/20*

U.S. Cl. 74—417 **6 Claims**

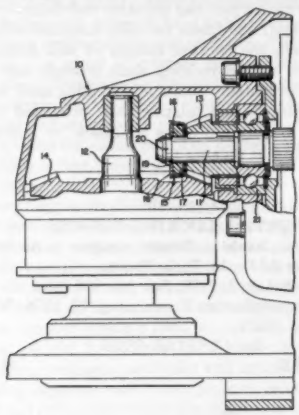
1. In an angle tool such as a grinder, polisher, sander, angle screwdriver or the like having a drive motor for driving an output spindle shaft, the motor having a drive shaft defining a longitudinal axis transverse to the output spindle shaft, a gear transmission connecting the drive shaft of the motor to the output spindle shaft, the gear transmission comprising:

first stop means on one of said shafts;

second stop means on said one shaft;

a first gear mounted on said one shaft between said first stop means and said second stop means so as to abut against said first stop means;

a second gear mounted on the other one of said shafts;



a resilient annular bearing tightly held between said second stop means and said first gear; and,

a cup-shaped retainer disposed on said one shaft for containing said resilient annular bearing.

4,135,412

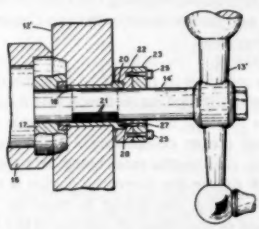
BACKLASH COMPENSATOR MECHANISM

Jerry L. Chrislock, Bethel Island, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 14, 1977, Ser. No. 860,654

Int. Cl.[2] F16H *55/18*

U.S. Cl. 74—441 **7 Claims**



1. In a machine tool that positions the workpiece or the tool by movement of a lead screw shaft and having a lead screw shaft position indicator, the improvement comprising means for compensating for backlash error in a lead screw shaft position indicator: said backlash compensating means consisting of a hollow member positioned about a lead screw shaft and secured to said position indicator; a first collar means fixedly secured to said lead screw shaft and positioned closely adjacent said hollow member, said first collar means having slot therein; a second collar means movably secured to said first collar means, said second collar means having a slot positioned to partially align with said slot of said first collar means and a pair of slots located radially outward from said slot; and pin means secured at one end to said hollow member and extending through a slot formed by coincidence of said partially aligned slots of said first and second collar means, such that movement of said lead screw shaft drives said first and second collar means which causes said pin means to drive said hollow member and the attached position indicator, and upon reversal of rotation of said lead screw shaft said collar means are not driven until said collar means have rotated so that said pin means is at an opposite end of the slot formed by said partially aligned slots and beyond which the lead screw shaft again drives said position indicator, thereby compensating for backlash error in the lead screw shaft position indicator.

4,135,413

DEVICE OR ARRANGEMENT OF PARTS FOR ELASTICALLY LOADING MOVABLE MEMBER

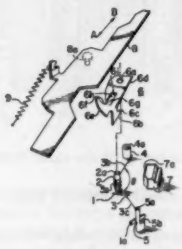
Hisashi Ichikawa, Katsuta, and Kenji Ogiro, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 28, 1977, Ser. No. 837,158

Claims priority, application Japan, Sep. 29, 1976, 51-129947[U]

Int. Cl.[2] G05G *5/06*

U.S. Cl. 74—529 **5 Claims**



1. A device or arrangement of parts for elastically loading a movable member, comprising:

(a) an elastic member having a central portion and two arms extending therefrom in opposite directions;

(b) a pivot, on which said central portion of said elastic member is fitted, with said two arms of said elastic member being deflected;

(c) a first locking member for locking one of said arms which are deflected;

(d) a second locking member for locking the other of said arms which are deflected;

(e) a movable member including (i) a guide portion which faces one of said arms, and pushes said arm so as to release said arm from its locking member associated therewith, and (ii) a locking portion continuous with said guide portion for locking said arm pushed by said guide portion, in a position away from said locking member, said movable member being elastically loaded by said elastic member; and

(f) a control member for abutting said movable member to limit the displacement of said movable member due to an elastic force of said elastic member.

4,135,414

METHOD OF MAKING INSERTED BLADE HOB

Edward W. Haug, and Charles E. Beck, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

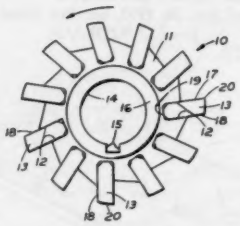
Division of Ser. No. 608,585, Aug. 28, 1975, Pat. No. 4,023,246. This application Feb. 10, 1977, Ser. No. 767,651

Int. Cl.[2] B21K *21/00*

U.S. Cl. 76—101 A **5 Claims**

1. A method for producing an inserted blade tool comprising the steps of forming a cylindrical core with an axial peripheral slot having a width to snugly receive a cutting blade, applying a liquid high shear strength adhesive to a surface to form an

interface between the slot and the cutting blade, inserting the cutting blade in said slot to establish the interface, retaining the



cutting blade in said slot prior to curing, and curing the adhesive to form a bond between the core and the cutting blade.

4,135,415

CORKSCREW

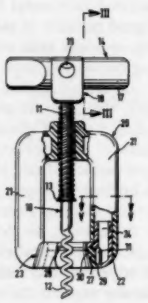
Johannes Liebscher, Nassau (Lahn), and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit International Gunter Leifheit GmbH, Nassau (Lahn), Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,752

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628352

Int. Cl.² B67B *7/00*

U.S. Cl. 81—3.38 A **13 Claims**



1. A corkscrew comprising, in combination, an elongated spindle having a longitudinal axis, a cork-engaging helix at a leading end portion, and an external thread at a trailing end portion thereof; means for supporting said spindle on a respective container during turning the latter about said longitudinal axis thus displacing the same longitudinally thereof between a retracted and an extended position, including a support having an abutment surface; a threaded member having engaging portions which engage said thread of said spindle, said threaded member being a nut surrounding said trailing end portion of said spindle means for turning said threaded member about said longitudinal axis and including a pair of projections which extend radially outwardly from said nut at opposite sides thereof; a locking element mounted on said threaded member for pivoting relative thereto about a pivoting axis normal to said longitudinal axis between a locking position in which it connects said threaded member to said spindle for joint turning and displacement toward said extended position, and an unlocking position in which it releases said spindle for displacement relative to said threaded member toward said retracted position, and having an actuating portion which engages said abutment surface of said support as said spindle approaches said extended position thereof to pivot said locking element from said locking to said unlocking position; and biasing means arranged between said locking element and at least one of said projections and urging said locking element toward said locking position thereof and being tensioned by a counterforce applied thereto when said actuating portion engages said abutment surface and an operator further rotates said turning means to permit said locking element to pivot relative to said threaded member, thereby releasing said spindle for displacement thereof toward said retracted position.

4,135,416

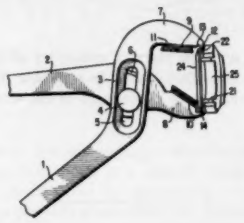
TOOL FOR OPENING AND CLOSING WRIST WATCHES

Jean Roux, Clos-á-Bec, La Sagne, Switzerland (2314)

Filed Oct. 18, 1977, Ser. No. 843,283

Int. Cl.² B25B *7/00*; G04D *3/00*

U.S. Cl. 81—5.1 R **3 Claims**



1. A tool for opening and closing tight-fitting watch-cases comprising:

a handle portion and

a forward extension hinge means intermediate said levers for closing said forward extensions when said handles are moved together,

a first of said forward extensions having an approximately flat inner surface covered with protective paddings, a recess adjacent said inner surface and terminating by a transversal wedge-type protrusion the height of which remains under the level of said inner surface,

the other of said forward extensions having an approximately flat inner surface covered with protective paddings intended to cooperate with said first inner surface in closing the watch-case,

one forward extension pressing on the upper surface of the watch-case, the other forward extension pressing on the back of the watch-case when moving handles together, followed by a portion of slanting surface cooperating with the protrusion of the first forward extension when opening a tight-fitting watch-case.

4,135,417

INFEED DEVICE FOR A TURNING MACHINE FOR FINISHING THE PERIPHERAL SURFACES OF ELONGATED WORKPIECES OF CYLINDRICAL CROSS-SECTION

Karl-Gustav Weck, Solingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 703,937, Jul. 9, 1976. This application Nov. 25, 1977, Ser. No. 854,751

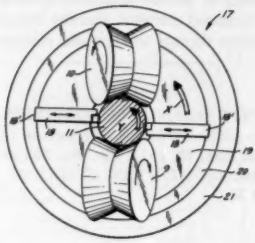
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531320

Int. Cl.² B23B *5/00*; B21C *37/30*

U.S. Cl. 82—20 **12 Claims**

1. In a turning machine with a cutter head for finishing the peripheral surface of elongated workpieces of circular cross-section, such as rods, wires and tubes, movable in longitudinal direction through the machine while the cutter head revolves in a predetermined direction about the axis of a workpiece, an infeed device comprising at least one pair of inlet rolls, at least one of said at least one pair of inlet rolls being a grooved roll, each of said inlet rolls having a plane of symmetry normal to the axis thereof, the plane of symmetry of each roll of a pair

being inclined through an angle relative to the direction of movement of the workpiece which is greater than zero and



smaller than 10°, with the plane of symmetry of the rolls in said at least one pair of rolls inclined in opposite directions with respect to the direction of movement of the workpiece.

4,135,418

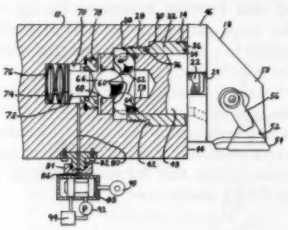
CLAMPING DEVICE

David M. McCray, Latrobe, and Robert S. Gulibon, Mt. Pleasant, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 717,231, Aug. 24, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,004

Int. Cl.[2] B23B *29/00, 5/22, 31/10*

U.S. Cl. 82—36 A **45 Claims**



1. In a turret for mounting on a machine; a tool holder having a shank with a free inner end and an insert supporting portion on the other end and a first abutment facing the free end, said turret having a bore to receive said shank inner end foremost and having a second abutment to engage said first abutment, an axial hole formed in said shank from the inner end thereof, radial holes extending inwardly in said shank and intersecting said axial hole and having axes disposed in a common plane perpendicular to the axis of said axial hole, outwardly movable clamp elements disposed in said radial holes, an actuator element in said axial hole on the side of said clamp elements facing the inner end of the shank, cooperating surfaces of abutment means on said clamp elements and in said bore, and actuating means located in said turret and operable for engaging said actuator element and for moving said actuator element toward said other end of said axial bore to urge said clamp elements radially outwardly in the respective radial holes so that said cooperating surfaces of abutment means engage and lock said tool holder against axial movement in said turret.

4,135,419

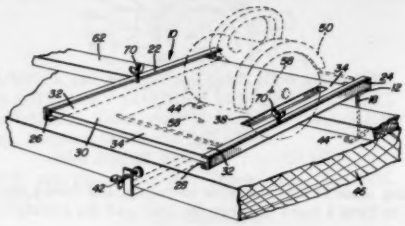
RIP-CROSS CUT GUIDE FOR CIRCULAR SAW

Everett E. Chapin, Latrobe, Calif., assignor to Vivian G. Chapin, Shingle Springs, Calif., a part interest

Filed Sep. 26, 1977, Ser. No. 836,617

Int. Cl.[2] B27B *5/20*

U.S. Cl. 83—471.3 **11 Claims**



1. A jig for supporting a circular saw and a workpiece for cross cutting rip cutting the workpiece, said jig including a main horizontal elongated support member having opposite end portions, a pair of parallel horizontal arms secured at one pair of corresponding ends to the opposite end portions of the upper marginal edge portion of said support member with the other pair of ends of said arms projecting outwardly from one side of said support member, one end portion of said support member having an upwardly opening notch formed in the upper marginal edge portion thereof inwardly of the corresponding arm, an elongated horizontal brace secured at one end to the lower marginal portion of said elongated support member intermediate its opposite ends and with the other end of said brace projecting outwardly from said one side of said support member with said arms disposed in a horizontal plane spaced above said brace, the opposite ends of said elongated support member including a pair of abutments projecting outwardly of said one side of said support member generally co-planar with the upper surface of said brace, said arms defining opposing guides, a horizontal square panel having pairs of opposite side edge portions guidingly receivable in said guides for guided movement therealong, an elongated closed-ended slot formed therein adjacent and paralleling one edge portion of one of said pairs of edge portions and means for clamping the base plate of a circular saw on the upper surface thereof with the circular blade of said saw received downwardly through said slot, said slot being aligned with said notch when said one edge portion is guidingly engaged in the guide adjacent said notch, the outer end of said brace including upwardly offset clamp means opposing and adjustably movable toward said one side of said support member.

4,135,420

DEVICES FOR SEVERING STRIPS

Dieter Maüs, Neuffen, and Hermann Buck, Huelben, both of Fed. Rep. of Germany, assignors to Bielomatik Leuze & Co., Fed. Rep. of Germany

Filed Jun. 9, 1977, Ser. No. 805,047

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628536

Int. Cl.[2] B26D *1/38, 1/56, 5/38*

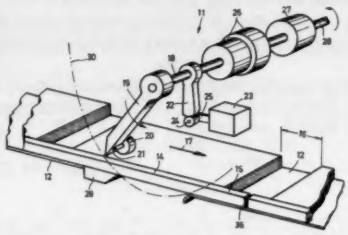
U.S. Cl. 83—371 **13 Claims**

1. A device for severing a strip which interconnects items conveyed one behind the other and spaced apart from each other, particularly a binding strip for the spine of books, blocks or the like, said device comprising:

a follower device for following the profile of the items;

a knife, the follower device mounted for movement together with the knife, the follower device being arranged to maintain the knife in a first position, under a force urging the knife towards a cutting position;

an externally energized knife drive for powerfully moving the knife through the cutting position; and,



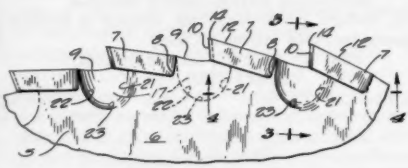
switching means for the knife drive, actuated by an initial movement of the knife due to the follower device detecting a gap between adjacent items.

4,135,421

QUIET RUNNING CIRCULAR SAW BLADE

James T. Bertram, Jasper, Ind.; Steven A. Segal, Atlanta, Ga., and Arthur R. Segal, Jasper, Ind., assignors to North American Products Corp., Atlanta, Ga.

Filed Aug. 19, 1977, Ser. No. 825,867
Int. Cl.[2] B27B *33/08*
U.S. Cl. 83—835 **7 Claims**



1. A circular saw blade of the type having teeth at circumferentially spaced intervals on the peripheral portion of a disc-like body that has axially oppositely facing substantially flat side surfaces, each of said teeth having a front face which faces in a forward substantially circumferential direction and extends across at least a major portion of the thickness of the body and having a radially outer face that intersects said front face at a cutting edge, and said body having a gullet for each tooth, the major portion of said gullet being circumferentially forward of said front face and said gullet extending a substantial distance radially inwardly from said cutting edge, said saw blade being characterized by:

A. each gullet being spanned, at least in substantial part in the circumferential direction, by a reduced thickness portion of the body which cooperates with circumferentially adjacent portions of the body to provide the blade with a near-circular periphery, but there being a portion of each tooth, having said front face thereon, which projects radialy beyond its forwardly adjacent reduced thickness portion of the body, the gullet thus having the form of a cavity in a side surface of the body which has its full depth at the periphery of the body; and

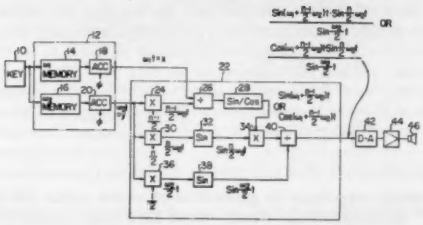
B. each of said cavities having its radially inner portion gradually diminished in depth radially inwardly and circumferentially rearwardly, so that chips which enter the cavity at the periphery of the blade can readily flow radially inwardly and circumferentially rearwardly out of the cavity.

4,135,422

ELECTRONIC MUSICAL INSTRUMENT

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 8, 1977, Ser. No. 766,595
Claims priority, application Japan, Feb. 12, 1976, 51/13242
Int. Cl.[2] G10H *5/00*
U.S. Cl. 84—1.01 **18 Claims**



1. In equipment for developing a waveshape and converting the waveshape to a signal in a desired frequency range, the improvement of a system for generating a composite waveshape having n possible components of different frequency in the amplitude of any sample point of the waveshape, comprising:

a first means for generating a first timing variable x;

a second means for generating a second timing variable y; and

a third means for carrying out, by the use of said first and second timing variables x and y, computation of a waveshape F(x, y) in accordance with the equation:

$$F(x, y) = \frac{\sin(x + \frac{n-1}{2} y) \cdot \sin \frac{n}{2} y}{\sin \frac{1}{2} y}$$

wherein: n is a nonincrementing single integer greater than one,

said third means including means for calculating the waveshape amplitude for each desired successive sample point of said waveshape by computing the right side of said equation only once per sample point regardless of the number or kind of said different frequency components contained in the waveshape amplitude at any sample point.

4,135,423

AUTOMATIC RHYTHM GENERATOR

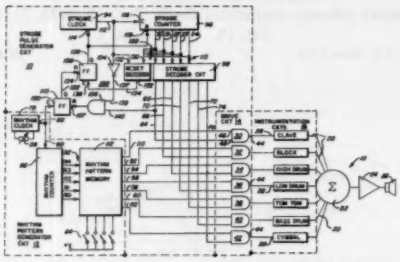
Glenn M. Gross, Chicago, Ill., assignor to Norlin Music, Inc., Lincolnwood, Ill.

Filed Dec. 9, 1976, Ser. No. 748,727
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.03 **20 Claims**

1. In an automatic rhythm generator of an electrical musical instrument having a plurality of audio output signals corresponding to a plurality of different instruments, means for establishing periodic rhythm cycles, and means for choosing one or more of said instrumentation circuits for development of its output signal during selected rhythm cycles, each of said instrumentation circuits requiring application of a drive pulse thereto of an appropriate width therefor to properly produce its audio output signal, the required drive pulse width being different for at least two of said instrumentation circuits, a control circuit of the rhythm generator, comprising:

means for digitally generating a plurality of strobe pulses respectively associated with said plurality of instrumentation circuits, said strobe pulses being generated without regard to which associated instrumentation circuits have been chosen, each of said strobe pulses having a prese-

lected width which is proportional to the drive pulse width for the instrumentation circuit with which it is associated the widths for at least two of said strobe pulses being different; and



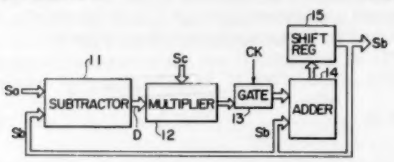
means responsive to generation of strobe pulses for those instrumentation circuits which have been chosen to provide drive pulses thereto of appropriate widths.

4,135,424

VARIABLE FUNCTION GENERATOR

Shimaji Okamoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 16, 1977, Ser. No. 769,303
Claims priority, application Japan, Feb. 25, 1976, 51-19743
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.13 **11 Claims**



1. A variable function generator, comprising, in combination:

a first means having a first input terminal for receiving a first input signal,

a second input terminal for receiving a second input signal,

an output terminal for generating an output signal proportional to the difference of said first and second input signals from said output terminal,

a second means for repeatedly transmitting the output signal of said first means at predetermined time intervals,

a third means having a third input terminal connected to the output terminal of said first means through said second means,

a fourth input terminal receiving said second input signal, and

an output terminal for generating a sum signal of the output signal of said first means and said second input signal, the sum signal being used as a renewed second input signal.

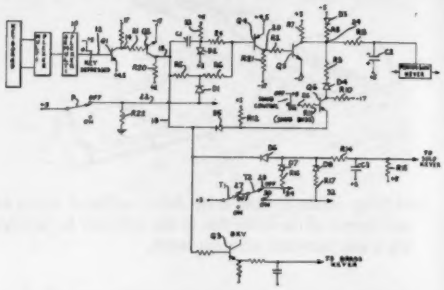
4,135,425

ENVELOPE GENERATOR FOR ELECTRONIC ORGAN

Patrick K. Doane, and David R. Springston, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Apr. 19, 1977, Ser. No. 788,884
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.13 **7 Claims**

1. An electric organ in which a depressable playing key corresponding to a predetermined note controls a voltage sensitive keyer for the note via an envelope control circuit, said circuit comprising an input which goes to a steady state voltage when the key is depressed, said circuit including an output, a first resistor connecting said output to the keyer and a capacitor connecting the keyer to a source of voltage, variable voltage supply means connected to said output and having a control terminal, and circuit means connecting said input to said control terminal and operable upon the initiation of said steady state voltage at said input to supply a voltage signal to said control terminal to establish a supply of keyer actuating voltage at said output, said circuit means comprising selector means including a switch having a first position in which said voltage signal remains constant as long as the key remains depressed and a second position in which the said voltage signal is in the form of a pulse to cause the keyer actuating voltage at said output to commence to decay immediately after establishing thereon.

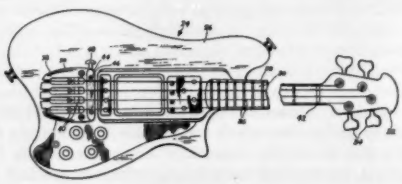


4,135,426

STRINGED INSTRUMENT BRIDGE

James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Filed Jan. 19, 1977, Ser. No. 760,737
Int. Cl.[2] G10H *3/00*
U.S. Cl. 84—1.16 **11 Claims**



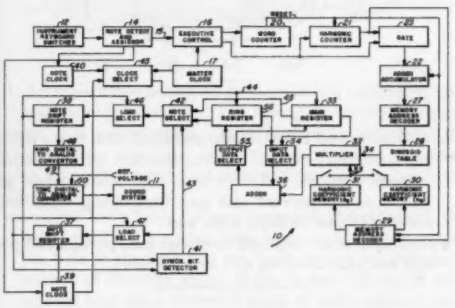
1. A bridge for use with a stringed musical instrument having a body and a plurality of strings extending over said body, said bridge comprising: a base having forward and rear ends, means for attaching said base to a body such as aforesaid whereby said base may be adjustably raised and lowered and tilted relative to said body, a plurality of saddles each slidably received on said base for slidably movement relative to said base along an axis extending across said forward and rear ends and parallel to the strings of the instrument with which said bridge is used, each of said saddles having a portion for supporting a respective one of said strings, adjustment means for releasably fixing each of said saddles to said base at any desired position within its range of movement relative to said base, said base at its said rear end having a rearwardly projecting lip extending transversely of said axes of saddle movement, said lip having a plurality of string slots, with open rear ends, each aligned with a respective one of said saddles for anchoring bead ended strings to said base, and a mute mounted on said base forwardly of said saddles and movable relative to said base into and out of engagement with said strings, whereby said saddles, said lip with slots for anchoring said strings and said mute all retain their given positions relative to one another and move in unison with said base as said base is moved from

one position of adjustment to another relative to said instrument body.

4,135,427
ELECTRONIC MUSICAL INSTRUMENT RING MODULATOR EMPLOYING MULTIPLICATION OF SIGNALS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Deutsch Research Laboratories, Ltd., Los Angeles, Calif.

Filed Apr. 12, 1976, Ser. No. 675,721
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.22 **10 Claims**



1. A musical instrument exhibiting a ring modulator effect whereby multiple signals are combined to produce a combination signal containing spectral components corresponding to multiples of the sum and difference frequencies of said multiple signals, said musical instrument comprising;

a computation cycle comprising a first portion wherein numbers Z(N) are computed and a second portion wherein numbers R(N) are computed,

a first memory means for writing a first master data set to be thereafter read out, wherein contents are set to zero values at start of said first portion of said computation cycle and wherein number N designates the address of words in said first memory means,

a second memory means for writing a second master data set to be thereafter read out, wherein contents are set to zero values at start of said second portion of said computation cycle and wherein number H designates the address of words in said second memory means,

first means for computing numbers Z(N) in said first master data set in accordance with the relation

$$Z(N) = \sum_{q=1}^{W} c_q \sin(\pi Nq/W)$$

where q = 1,2, . . . ,W; N = 1,2, . . . ,2W; W is the number of harmonic components defining said number Z(N) in first master data set and c_q is the harmonic coefficient of the corresponding q^{th} component; and for computing numbers R(H) in said second master data set in accordance with the relation

$$R(H) = \sum_{q=1}^{U} d_q \sin(\pi Hq/QW)$$

where H= 1,2, . . . ,QN is an index designating the component numbers in the second master data set, U is a number not greater than said number W and is the number of harmonic components defining R(H); d_q is the harmonic coefficient of the corresponding q^{th} component; and Q is a phase resolution constant; said first means comprising:

a memory storing said harmonic coefficients sets c_q and d_q,

a sinusoid table comprising a memory storing values of sin $(\pi\phi/W)$ for $0 \leqq \phi \leqq 2W$ at intervals of D where D is a resolution constant, and

harmonic component evaluation circuitry utilizing said memory for storing said harmonic coefficients and said sinusoid table to calculate $c_q \sin(\pi Nq/W)$ for each of the W harmonic components of said numbers Z(N) in accordance with a selected value of N and to calculate $d_q \sin(\pi Hq/WQ)$ for each of the U harmonic components of said numbers R(H) in accordance with selected values of H and said resolution constant Q;

a means for successively algebraically summing output of said harmonic component evaluation circuitry with contents of word N in said first memory means during said first portion of said computation cycle and for successively algebraically summing output of harmonic component evaluation circuitry with contents of word H in said second memory means during said second portion of computation cycle,

a third memory means for writing data to be thereafter read out,

a fourth memory means for writing data to be thereafter read out,

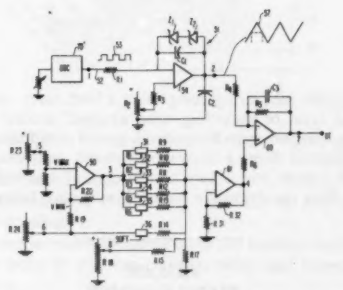
a second means responsive to said first means for transferring said first master data set from said first memory means to said third memory means and for transferring phase shifted data from said second memory means to said fourth memory means, and

a third means responsive to said second means for providing musical tones in accordance with the product of waveshapes corresponding to said first and second master data sets whereby said musical tones exhibiting said ring modulator effect.

4,135,428
CIRCUIT FOR CONTROLLING THE EXPRESSION OF AN ELECTRONICALLY CONTROLLED KEYBOARD INSTRUMENT

Joseph M. Campbell, Lewisburg, Tenn., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 2, 1977, Ser. No. 792,846
Int. Cl.[2] G10G *3/04;* G10H *1/02*
U.S. Cl. 84—1.24 **4 Claims**



1. In an electronically controlled player piano system having a piano keyboard wherein the keys thereof are solenoid operated, and provided with transistor switch means controlling the operating current to the solenoids, a source of signals for controlling the operation of the solenoids for causing the keys to be struck and produce the notes of a musical presentation as recorded on a record medium, said record medium also having recorded thereon expression information collated with the musical presentation, said expression information being recorded in the form of binary coded expression information bits on said record medium, the improvement in re-creating the expression effects comprising:

means to generate a triangular waveform voltage,

means adapted to receive said binary coded expression information bits and generate one of a plurality of discrete voltage levels, each discrete voltage level corresponding to an expression level defined by said binary coded expression bits,

difference amplifier means having a pair of input terminals and an output terminal,

means to apply said triangular waveform voltage to one of said input terminals,

means to apply one of said discrete voltage levels as produced by said means to generate a plurality of discrete voltage levels to the other of said input terminals of said difference amplifier means to produce a sequence of pulse width modulated pulses having a rate corresponding to the rate of said triangular waveform voltage and width corresponding to the coincident level of said one discrete voltage level with respect to said triangular waveform voltage and the projection of the points of coincidence on the time axis thereof being the width of said pulses,

gate circuit means receiving as inputs the signals from said difference amplifier and said signals for controlling the operation of said solenoids, and

means connecting said gate circuit means to the said transistor switch means for controlling said solenoids and thereby re-create the expression effects for said musical presentation.

4,135,429

PIANO BASS STRING

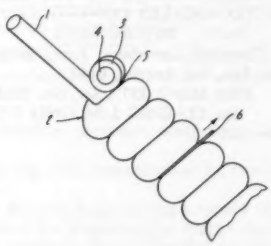
Klaus-Peter Heyne, 6200 Wiesbaden, Fed. Rep. of Germany

Filed Jun. 18, 1976, Ser. No. 697,377

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610588

Int. Cl.[2] G10C *3/06*

U.S. Cl. 84—199 **4 Claims**



1. A piano bass string comprising a load carry wire and at least one layer of encircling wire wrapped around said load carrying wire, wherein the encircling wire comprises a tubular casing formed from a drawable material, said casing being made of copper, and drawn over a core of material which is heavier than the drawable material, said core being made of lead.

4,135,430

PIANO HAMMER

Hajime Hayashida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 26, 1977, Ser. No. 800,859

Claims priority, application Japan, May 31, 1976, 51-69758; May 31, 1976, 51-69759

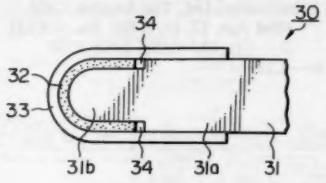
Int. Cl.[2] G10C *3/18*

U.S. Cl. 84—254 **12 Claims**

1. An improved piano hammer, comprising:

a generally elongated base portion, said base portion having an end portion at the end of said hammer with which said hammer strikes, said base portion having a first terminal portion which is shaped and positioned for facing toward a second terminal portion of a striking head,

a striking head comprised of an elastic material and located at and being directly secured to said base portion end portion, said striking head having a second terminal portion which faces toward and is in opposition to said base portion first terminal portion, said striking head second terminal portion being at a terminal end of the said direct securement between said striking head and said base portion end portion.



said striking head being shaped and sized such that a refuge gap is normally defined between said first and said second terminal portions, and there is no obstruction in said gap which would prevent said gap from being filled with material of said striking head, and

a protective cover disposed over said base portion end portion and also covering said striking head.

4,135,431

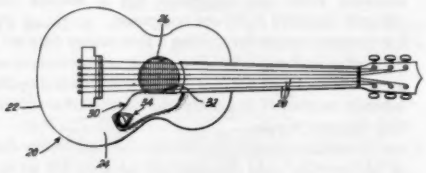
STRINGED MUSICAL INSTRUMENT PICK DISPENSER

Richard R. Ferguson, 3602 Raymond, Fort Wayne, Ind. 46803

Filed Oct. 15, 1976, Ser. No. 732,585

Int. Cl.[2] G10D *3/00*

U.S. Cl. 84—329 **1 Claim**



1. A stringed musical instrument pick dispenser for a pick having a plucking apex end and an opposed base for musician gripping comprising:

a musical instrument having a sound board and a plurality of strings mounted in spaced relation to said board;

a pick dispenser housing being mounted to said instrument in predetermined relation to said strings;

said housing having a wall with upper and lower edges;

a bottom side being affixed to the lower edge of said wall and a top side being fixed to the upper edge of said wall defining an enclosure area for pick storage;

a dispensative opening being formed adjacent said top said to receive a pick, and the inner surface of said top side providing a retaining surface for engaging said pick;

said top side being inclined upwardly relative to said bottom side toward said opening;

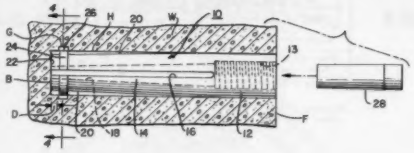
resilient means being mounted in said housing for exerting a resilient force in a direction to urge a retained pick toward said opening, said resilient means comprising a wedge shaped member made of a sponge-like resilient plastic material generally conforming in shape to the shape of said enclosure area;

said housing being fixedly mounted relative to said sound board in a predetermined relation to the strings of the instrument.

4,135,432
ANCHOR FOR UNDERCUT BORE

Roger D. Schalge, Mahopec, and Gus Neos, Astoria, both of N.Y., assignors to Drilco Equipment Company, Inc., Long Island City, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,797
Int. Cl.[2] F16B *13/04*
U.S. Cl. 85—84 **3 Claims**



1. An expandable anchor to be inserted in a cylindrical hole in a wall having a blind end and having an undercut annular groove at a predetermined axial location in the hole, the groove having inner and outer radially disposed shoulders having a predetermined axial spacing from said blind end, the anchor comprising:

an anchor body having a bore extending therethrough, the axial length of the anchor body being equal to the depth of the hole in the wall and the body having an outermost portion of diameter snugly fitting in said cylindrical hole and the bore being threaded inside of said outermost portion, and the anchor body having an innermost expandable portion joined to said outermost portion and tapering downwardly in diameter therefrom to the inner end of the body, the bore in the innermost portion tapering down from the diameter of said threaded portion to a smaller diameter at said inner end of the body;

an annular locking collar extending around the anchor body and having inner and outer shoulders mutually separated by said predetermined axial spacing and the spacing of the locking collar from the inner end of the expandable portion of the body being equal to the spacing of the annular groove from the blind end of the hole, the shoulders being radially disposed when the innermost portion of the body is expanded, and the collar being of diameter about equal to the diameter of the outermost portion of the anchor body when the innermost portion of the body is unexpanded, said innermost expandable portion of the body having multiple annularly spaced axially elongated slots extending from the junction of the outermost portion of the anchor body through the inner end of the body and dividing the innermost portion of the body and the collar into independently expandable segments;

a tapered expansion pin insertable into the bore and of diameter sufficient to expand the expandable segments outwardly to fit the hole and the undercut groove; and

a threaded member having a threaded portion shaped to be screwed into the threaded portion of the bore and having a pusher pin shaped to extend into the expandable portion of the body and push the tapered expansion pin all the way to the inner end of the body.

4,135,433
LOADING DEVICE FOR A FIREARM

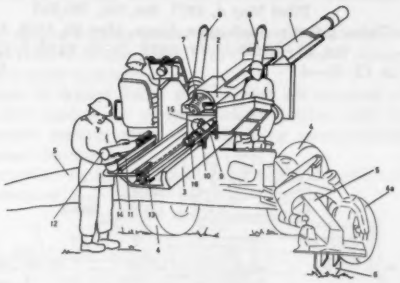
K. Sten R. Hultgren, and J. P. Goran Sundmar, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Mar. 16, 1977, Ser. No. 778,286
Claims priority, application Sweden, Mar. 31, 1976, 7603850
Int. Cl.[2] F41F *9/06*
U.S. Cl. 89—47 **5 Claims**

1. An assembly for loading a projectile and a separate propellant charge into an artillery-type firearm, comprising:

a rammer assembly including a carrying member having a curved cross-section for supporting said propellant charge in axial alignment with said separate projectile;

a rammer car positionable in a longitudinally extending cradle of said firearm; and

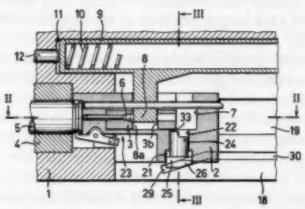


means extending between said rammer car and said rammer assembly for swinging said carrying member along an arc-shaped curve between a first position with an axis extending axially through a barrel of said firearm.

4,135,434
BREECHBLOCK FOR AN AUTOMATIC FIRING WEAPON

Ernst Hürlemann, and Werner Bosshard, both of Zürich, Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,913
Claims priority, application Switzerland, Nov. 12, 1976, 14250/76; May 26, 1977, 6488/77
Int. Cl.[2] F41D *11/06*
U.S. Cl. 89—181 **9 Claims**



1. A breechblock for an automatic firing weapon, comprising:

a breechblock housing;

a breechblock head displaceably mounted in said breechblock housing;

at least one movable blocking body for locking the breechblock head in a firing position with said breechblock housing;

a spring-loaded control element displaceable in the breechblock housing;

said control element having a control surface by means of which there can be positionally shifted the blocking body;

said control element having a recess;

a locking bolt arranged in said breechblock head and displaceable into said recess of the control element;

said locking bolt coupling the breechblock head decoupled from the breechblock housing with the control element;

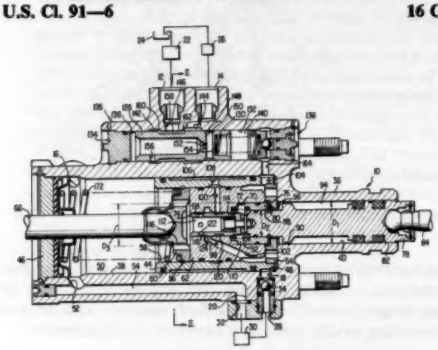
said control surface and said blocking body coacting with one another so as to provide a certain amount of play therebetween and by means of which the control element is uncoupled prior to reaching the firing position of the breechblock head.

4,135,435

REACTION MECHANISM OF A HYDRAULIC CONTROL VALVE

Yoshiharu Adachi, Gamagori, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed May 4, 1977, Ser. No. 793,533
Claims priority, application Japan, May 10, 1976, 51/52175
Int. Cl.[2] F15B *13/14*; F01B *25/02*; F15B *9/10*
U.S. Cl. 91—6 **16 Claims**



1. A reaction mechanism which comprises:
at least one pump;
a control valve for regulating hydraulic pressure by controlling hydraulic fluid disgorged from said pump;
an input member mechanically connected to said control valve and operated by a driver, said input member having a smaller diameter portion and a larger diameter portion, the larger diameter portion being located closest to the driver;
an annular reaction regulating member in which said smaller diameter portion of said input member is slidably inserted;
biasing means for normally urging said annular member toward said larger portion of said input member; and
means for supplying said hydraulic pressure regulated by said control valve into an area between said annular member and said larger diameter portion of said input member to displace said annular member in a direction away from said larger diameter portion of said input member and in the same direction as the displacement of the input member against said biasing means; whereby the displacement of said annular member reduces the reaction of said input member to variations of said hydraulic pressure when said hydraulic pressure is below a predetermined value.

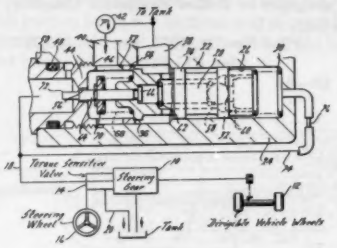
4,135,436

TWO-STAGE FLOW CONTROL VALVE FOR A POWER STEERING SYSTEM

James J. Duffy, Livonia, Mich., assignor to Ford Motor Co., Dearborn, Mich.

Filed Aug. 3, 1977, Ser. No. 821,441
Int. Cl.[2] F15B *11/08*
U.S. Cl. 91—468 **4 Claims**

1. In a pressure and flow control valve for a power steering system, said system comprising a steering gear adapted to be connected to dirigible vehicle wheels, a power steering pump, a pressure passage extending from said pump to said gear, a pressure and flow control valve situated in and partly defining said passage, a valve chamber forming a part of said valve, a valve spool slidably situated in said valve chamber, a flow restricting orifice situated in said pressure passage, a metering pin carried by said valve spool and registering with said orifice while establishing a controlled flow, spring means normally urging said metering pin to a fixed position relative to said valve spool, said metering pin being movable relative to said valve spool in response to a predetermined pressure buildup in said passage whereby said metering pin is moved from a first operating position to a second operating position, the effective diameter of the portion of the pin in said orifice being smaller



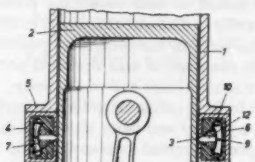
when said pin is shifted in response to pressure build up in said pressure passage therby accommodating increased flow under operating conditions that require an increase in pump pressure.

4,135,437

PISTON MACHINE HAVING A NON-CONTACTING SEAL

Hans Fimml, Klausenerstrasse 4, Innsbruck, Austria

Filed Sep. 7, 1977, Ser. No. 831,234
Claims priority, application Austria, Sep. 14, 1976, 6786/76
Int. Cl.[2] F16J *15/16*
U.S. Cl. 92—168 **6 Claims**



1. A piston machine comprising
a cylinder having a cylinder wall, which has an inside peripheral surface.
a piston which is movable in said cylinder and has a piston wall, which has an outside peripheral surface which defines a clearance space with said inside peripheral surface,
an annular peripheral slot formed in one of said walls adjacent to the other,
a chamber structure which forms part of said one wall and defines an annular peripheral chamber, which surrounds said slot and communicates therewith,
an annular peripheral hollow conductor, which is contained in said chamber and has an apertured wall portion which faces said slot and is concave toward the same, and
means for maintaining electrostatic charges having the same polarity on said inside and outside peripheral surfaces and for emitting electrons, which means comprise an anode and at least one cathode contained in said hollow conductor and are operable to cause electrons to be emitted from said cathode and to become trapped by gas molecules contained in said hollow conductor so that said gas molecules are converted into gas ions, to cause said gas ions to move through said apertured wall portion and said slot into said clearance space, and to cause electric fields to be established in said clearance space adjacent to said slots on opposite sides thereof so that said electric fields confine said gas ions in said clearance space adjacent to said slot to form a gas ion barrier which seals said clearance space.

4,135,438

DEVICE FOR ROUGHENING THE EDGE SURFACE OF A PLURALITY OF SHEETS

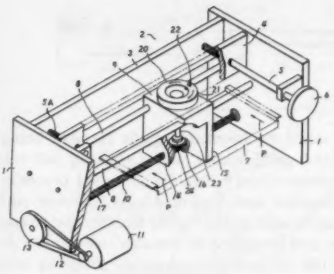
Yasuji Sugioka, 74, Kitahigashino-cho, Nishihichijo, Shimogyo-ku, Kyoto, Japan (600)

Filed Apr. 18, 1977, Ser. No. 788,690

Claims priority, application Japan, Apr. 27, 1976, 51-52655[U]

Int. Cl.[2] B26D *3/08*

U.S. Cl. 93—1 G 9 Claims



1. A device for roughening the edge surface of a plurality of sheets to be bound into a book, comprising: means for clamping said plurality of sheets; a scoring unit comprising a rotatable blade holding base, a scoring blade mounted thereon, and means for rotating said base so that said blade passes repeatedly across said edge surface in pairs of oppositely oriented semicircular arcs that extend widthwise of said edge surface; and means for causing relative movement of said scoring unit to the edge surface of said clamped sheets while said base is rotated so that each complete revolution of said scoring blade makes a pair of oppositely oriented arcuate score deformations in said edge surface, each of which deformations have a V-shape, and wherein the resulting V-shaped edge portions of individual ones of said sheets that together define such deformations are deflected by said scoring blade in one widthwise direction along a first of said pair of arcuate deformations and in the opposite widthwise direction along the other of said pair of arcuate deformations.

4,135,439

CARTON BOTTOM BREAKER

Howard E. Murrah, Fenton, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed May 5, 1977, Ser. No. 731,175

Int. Cl.[2] B31B *1/52*

U.S. Cl. 93—36.8 4 Claims

1. In a carton bottom breaker apparatus for performing a pre-breaking operation on the fold-over and fold-in panels of the bottom closure structure of a coated paperboard carton mounted on a carton mandrel, the combination comprising:

(a) a movable carrier member disposed under the mandrel;

(b) a fold-in panel breaker means movably mounted on said carrier member;

(c) a fold-over panel breaker means fixedly mounted on said carrier member whereby when the carrier member is moved upwardly toward the mandrel, the fold-in panel breaker means and the fold-over panel breaker means engage said panels and force them upwardly into close contact with the mandrel, thereby causing the panels to break along their score lines;

(d) said fold-in panel breaker means is provided with spring means for normally biasing the fold-in panel breaker means upwardly above the fold-over panel breaker means so that the fold-in panel breaker means engages the fold-in panels before the fold-over panels are engaged by the fold-over panel breaker means;

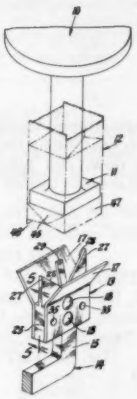
(e) a mandrel stop finger carried by said fold-in panel breaker means for engagement with the bottom end of the mandrel to limit the movement of the fold-in panel breaker means toward the mandrel;

(f) a V-shaped breaker plate member that is disposed in a vertical plane transverse to the planes of the fold-in panels;

(g) a V-shaped breaker means that is perpendicularly disposed relative to the plane of the fold-in panel V-shaped breaker plate member;

(h) a pair of sloping folder plates which are mounted on opposite sides of the movable carrier member with the V-shaped breaker plate member being intermediately disposed therebetween;

(i) a first plate portion fixedly secured to said movable carrier member;



(j) an integral second portion which diverges sideward outwardly from the intermediately disposed V-shaped breaker plate member;

(k) a pair of vertically extended elongated slots formed in the body portion of the V-shaped breaker plate member, in each of which is movably mounted a spacer and spring stop member;

(l) each of said spacer and spring stop members having reduced diameter end portions which are fixed to the first plate portions of the sloping folder plates; and,

(m) a spring mounted in each of said elongated slots above the spacer and spring stop member, and having one end engaging said stop member and the other end engaging the upper end of the slot in the V-shaped breaker plate member body portion for normally biasing the V-shaped breaker plate member in an upward direction relative to the carrier member.

4,135,440

METHOD AND APPARATUS FOR VENTILATING OR AIR CONDITIONING OCCUPIED ROOMS

Friedrich H. Schmidt, and Fritz Reuter, both of Hohenzallernring 51, Cologne, Fed. Rep. of Germany (5000)

Filed Jun. 10, 1976, Ser. No. 694,573

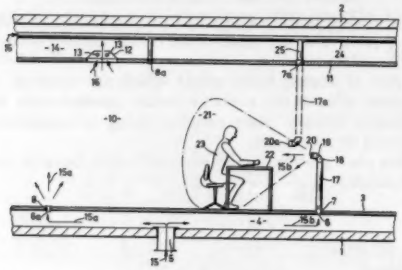
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1975, 2525917

Int. Cl.[2] F24F *13/10*

U.S. Cl. 98—31 27 Claims

1. In an air conditioning system of a room used by persons occupying one or more zones, such as work stations or the like, in which a volume of fresh air fed into the room is divided into two parts, a first part of which is fed with a low velocity into the room to establish in the latter an overall primary climate and a second part of which is fed through regulatable air discharge devices in air streams differing in velocity from said low velocity to at least one of said zones so as to provide a

person occupying said zone with a local climate differing from said overall climate in said room, each of said regulatable air discharge devices through which supplemental air forming a portion of said second part of fresh air is blown into the room comprising a unit having at least three air conducting passages



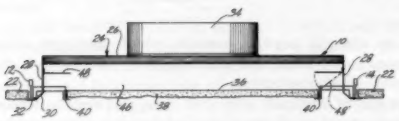
by which discharging supplemental air is directed, each passage having an axis establishing the direction of the respective discharge stream flow, said passages being simultaneously adjustable without tools to thereby adjust the direction of the respective axis.

4,135,441

INTEGRATED AIR DIFFUSER

Francis L. McCall, Hacienda Heights, Calif., assignor to Specified Ceiling Systems, Alhambra, Calif.

Filed Mar. 22, 1977, Ser. No. 780,237
Int. Cl.[2] F24F *13/08*
U.S. Cl. 98—40 D **12 Claims**



1. A ceiling mounted air diffuser system for directing air through an opening in the ceiling in an air flow pattern extending horizontally along the surface of the ceiling, comprising a grid-like framework, ceiling panels supported by the framework, the panels having substantially flat horizontal top and bottom surfaces, the framework and one of the ceiling panels having an elongated opening between the panel and the adjacent edge of the framework, means forming an air plenum chamber above the opening, the means forming an air plenum chamber having a side wall engaging the framework and forming a margin of said elongated opening, means directing air into the plenum chamber toward the top surface of the panel, the portion of the top surface of the panel adjacent the opening forming a recessed horizontal deflection surface at the bottom of the plenum chamber, the width of said elongated opening being widest at the lowest margin of the opening and decreasing in width at a horizontal plane intermediate the plane of the bottom surface of the ceiling panel and the plane of the top surface of the panel.

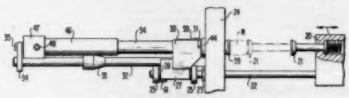
4,135,442

NUT CRACKING MACHINE

Marvin L. Nafziger, Marietta, Ga., and John A. McMennamy, Manilla, Philippines, assignors to Sunnyland Farms, Inc., Albany, Ga.

Filed Feb. 17, 1978, Ser. No. 878,922
Int. Cl.[2] A23N *5/00*
U.S. Cl. 99—582 **10 Claims**

1. A nut cracking machine comprising a fixed guide means, a reciprocatory means including a first nut cracking die and an extension member having guided engagement with said fixed guide means, an opposing hammer actuated nut cracking die on the fixed guide means coaxial with said first die and spaced laterally of said extension member, a reciprocatory stored energy driven hammer including a hammer guide member coaxial with said hammer actuated die, another guide member in laterally spaced parallel relation to the hammer guide member and said extension member and having a cam element



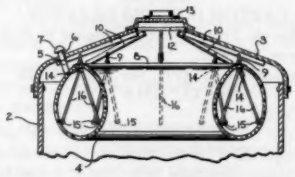
intermediate its ends, the lastnamed guide member being secured to said fixed guide means, and a cocking and release device for said reciprocatory hammer mounted pivotally on said extension member and having a cam follower surface adapted to ride along said another guide member and to engage said cam element and be shifted by the cam element in a direction to release the reciprocatory hammer from its cocked stored energy position, whereby the hammer is then moved by the stored energy against said hammer actuated die.

4,135,443

SELF-ADJUSTING BREATHER BAG

Bruce J. Warren, McHenry, Ill., assignor to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Apr. 14, 1977, Ser. No. 787,325
Int. Cl.[2] A23P *1/00*; A01F *25/00, 25/16*
U.S. Cl. 99—646 S **10 Claims**

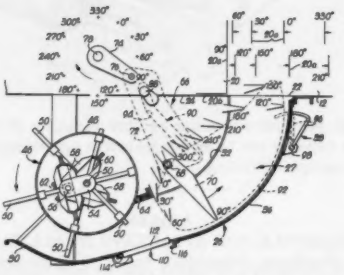


1. A self-adjusting breather system for use in connection with a substantially sealed storage structure, which comprises a breather bag assembled with the storage structure and connected thereto to prevent contact of the ambient air with the stored material whereby under certain conditions the bag is in an inflated or a deflated condition, and a plurality of longitudinally extending self-adjusting resilient members intermittently connected to at least the upper and the lower portions of the bag and which have sufficient resilience to elongate and stretch repeatedly and thereby expand a substantial distance downwardly when the bag is in an inflated condition and to automatically retract to substantially an initial position and pull the bottom portion of the bag upwardly toward the upper portion of the bag when the bag is in a deflated condition due to external and internal pressure changes.

4,135,444
APPARATUS FOR LOADING AND BALING CROP MATERIAL

Allen A. White, Peabody; Cecil L. Case, Newton; Thomas W. Ankenman, Hesston, and George Yatcilla, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 737,472, Nov. 1, 1976, Pat. No. 4,106,268.
This application Dec. 8, 1977, Ser. No. 858,852
Int. Cl.[2] B30B *15/14, 3/00*
U.S. Cl. 100—50 **8 Claims**

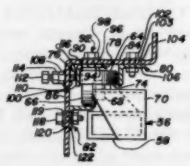


1. In a machine for baling a volume of material supplied at an irregular rate:
- a hollow bale case defining a baling chamber;
- a plunger within said chamber;
- means for continuously reciprocating said plunger to compact material delivered into the chamber;
- a loading duct communicating with said chamber and through which a charge of material be delivered to the chamber;
- apparatus for continuously feeding material into said duct to accumulate a material charge of predetermined characteristics;
- a loader operable to successively stuff charges from said duct into the chamber;
- means for driving said loader in timed relation to reciprocation of the plunger; and
- a clutch between said driving means and the loader for the temporary disengagement of the loader from the driving means without affecting the operation of said plunger is a charge having said predetermined characteristics fails to accumulate in said duct during the preceding stuffing cycle.

4,135,445
ADJUSTABLE RAIL ASSEMBLY FOR ACCURATE BALER PLUNGER GUIDANCE

Kenneth E. Smith, Strasburg, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 2, 1976, Ser. No. 710,770
Int. Cl.[2] B30B *1/00, 9/38*
U.S. Cl. 100—179 **11 Claims**

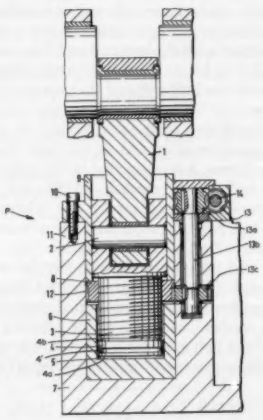


6. In a baler having a fore-and-aft extending bale case, drive means on said baler, a plunger mounted within said bale case for reciprocatory fore-and-aft movement therein, rod means operatively interconnecting said drive means to said plunger so as to transmit reciprocatory motion from said drive means to said plunger for driving the same, arm means fixed to said plunger and movable therewith, said arm means including at least a first roller mounted thereon and rotatable about a vertical axis, and an improved assembly for guiding said arm means and thereby said plunger throughout its reciprocatory movement within said bale case, said improved assembly comprising:
- fore-and-aft extending rail means including at least first and second rail members mounted on said bale case for contact, respectively, with two opposing sides of said first roller for guiding said arm means during its reciprocatory movement with said plunger; and
- lateral adjustment means including a series of fore-and-aft spaced apart fasteners interconnecting said first and second rail members to said bale case so as to facilitate lateral adjustment thereof to, and then attachment thereof at, a position on said bale case in parallel correspondence with the reciprocatory path of said plunger.

4,135,446
PRESS ARRANGEMENT

Alfred Bareis, Uhingen, and Reinhard Braun, Eislingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,428
Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621727
Int. Cl.[2] B30B *1/26*
U.S. Cl. 100—257 **8 Claims**



1. A press arrangement comprising:
- a press table,
- a punch means,
- adjusting means for selectively adjusting a distance between said punch means and said press table including
  - a rotatable threaded nut mounted in said punch means so as to be axially fixed with respect thereto, and
  - a non-rotatable threaded bolt means cooperating with said rotatable threaded nut and mounted in said punch means so as to be axially displaceable therein,
- connecting means for connecting a first end of said threaded bolt means with a drive element of the press arrangement, and
- tension creating means arranged in said punch means and cooperating with a second end of said threaded bolt means for selectively creating constantly-acting tension on said adjusting means, said tension creating means including
  - a single pressure space means, provided in said punch means, for selectively receiving a supply of a pressure medium during a pressing operation of said punch

means, said pressure space means being selectively relievable in order to release said punch means in event of seizure, and said pressure space means being disposed directly in a path of force transmitting power between said connecting means and a lower portion of said punch means to a workpiece.

4,135,447

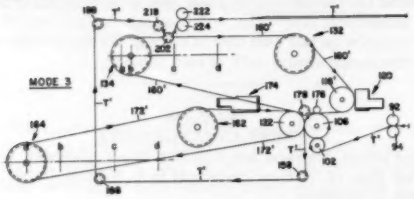
MACHINE FOR PRINTING MEASURING TAPE

Carl K. Barnes, and John O. Barnes, both of Suffield, Conn., assignors to Jack Barnes Engineering, Inc., Enfield, Conn.

Continuation-in-part of Ser. No. 687,107, May 17, 1976, Pat. No. 4,051,774. This application Jul. 22, 1977, Ser. No. 818,156

Int. Cl.[2] B41F *17/00, 17/10*

U.S. Cl. 101—177 **3 Claims**



1. A machine for printing measuring tapes of various lengths comprising: a plurality of interconnected modules including a tape supply and take-up module having a tape supply portion and a tape take-up portion, a printing module, an induction generator and control module and a stabilizing module, the printing module including a bull roll and a first pin roll, first means cooperant with the bull roll and first pin roll for printing indicia of a first color on the face of a tape blank, second means cooperant with the bull roll and first pin roll for printing other indicia of a second color on the same face of the so printed tape blank, the stabilizing module including an induction heating coil, water spray nozzles and an air blast through which the printed tape passes, a take-up reel at the take-up portion of the tape supply and take-up module, a drive roll at the stabilizing module, separate drive means for the take-up reel, the drive roll and the bull roll, and separate control means for each drive means, dancer subassemblies at the tape take-up portion of the tape supply and take-up module and at the stabilizing module for maintaining the tape under constant tension, and a fixed gear drive system in the printing module linked to all rolls of the printing module, each roll of the printing module with the exception of the bull roll being linked to one of the gears of the fixed gear drive system by double universal drive means.

4,135,448

MECHANISM FOR CLEANING A CYLINDER OF AN OFFSET LITHOGRAPHIC PRINTING PRESS

Hans J. Moestue, Osteraskroken 9, N-1345 Osteras, Norway

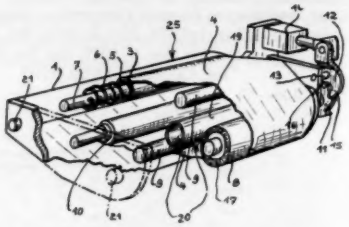
Continuation-in-part of Ser. No. 612,325, Sep. 11, 1975, abandoned. This application Jun. 30, 1977, Ser. No. 811,831

Claims priority, application Norway, Sep. 11, 1974, 743261; Fed. Rep. of Germany, Aug. 27, 1975, 2538067

Int. Cl.[2] B41F *35/06;* **B41L** *41/06*

U.S. Cl. 101—425 **10 Claims**

1. A mechanism for cleaning a driven blanket cylinder of an offset lithographic printing press comprising a magazine roller, a wash cloth web, means for incrementally advancing the wash cloth from the magazine roller, a pressure mechanism which may be pressed against the blanket cylinder to be cleaned and over which the advancing wash cloth web is incrementally moved in a transport direction, means for moving the pressure mechanism into and out of contact with the driven blanket cylinder with the wash cloth web therebetween, the pressure mechanism including a pressure roller, the wash cloth being incrementally advanceable while the pressure roller and driven blanket cylinder are out of contact, a take-up roller for rewinding the wash cloth web, and means in juxtaposition to the pressure roller for selectively dispensing at least one cleaning fluid onto the wash cloth immediately before the wash cloth



contacts the pressure roller so that cleaning of the driven blanket cylinder can be accomplished at operational speeds of the lithographic printing press.

4,135,449

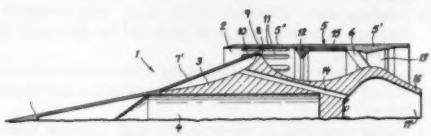
PROJECTILE FOR ATTACKING SMALL TARGETS

Jürgen Prochnow, Düsseldorf, and Wolf Trommsdorff, Porz-Grengel, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Porz-Wahn, both of, Fed. Rep. of Germany

Filed Jun. 20, 1975, Ser. No. 589,790

Int. Cl.[2] F42B *11/14*

U.S. Cl. 102—52 **6 Claims**



1. A projectile to be fired from a gun barrel, comprising:

an armor-piercing body centered on an axis;

a sleeve spacedly surrounding said body and defining therewith a forwardly and rearwardly open ring channel, said sleeve being axially divided into a rear portion rigid with said body and a front portion slidable with reference thereto; and

annular shutter means on an inner peripheral surface of said front portion engaging a coacting annular formation on said body in a forward position of said front portion for obstructing said ring channel upon the firing of the projectile from a gun barrel surrounding said sleeve, said front portion being repressible in flight by ambient-air pressure on said shutter means into a rearward position in which said ring channel is unblocked for the passage of air therethrough.

4,135,450

METHOD OF UNDERGROUND MINING

Leslie C. Lang, Beaconsfield, Canada, assignor to Canadian Industries Limited, Montreal, Canada

Continuation-in-part of Ser. No. 698,056, Jun. 21, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 807,881

Claims priority, application Canada, Jul. 11, 1975, 231434

Int. Cl.[2] F42B *3/00*

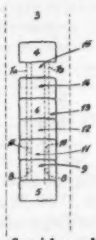
U.S. Cl. 102—23 **3 Claims**

1. A method of excavating an underground chamber in a body of strong rock or mineral having a uniaxial compression strength of at least 10,000 psi wherein the rock or mineral is fragmented by an explosive force and dislodged from the roof of the chamber, comprising the steps of:

(a) providing a plurality of spaced apart cylindrical cavities

in a zone in the roof of an underground chamber, said cavities having a diameter in excess of 12.7 cm.;

(b) locating an explosive charge in each cavity so that the explosive occupies substantially all of the cross-section of the said cavity, said explosive charge having a diameter-to-length ratio not exceeding 1:6 and said explosive charge being stemmed in said cavity in such a position to produce an optimum cratering effect upon detonation, said cavities being arranged such that adjacent craters to be produced upon detonation overlap throughout said zone;



(c) detonating each of said explosive charges to produce inverted or up-side down overlapping craters throughout said zone whereby all the rock or mineral in said zone is fragmented and thereafter falls by gravity to the floor of said chamber, leaving the rock or mineral not fragmented by the detonations in place in the roof; and

(d) removing from said chamber the fragmented rock or mineral dislodged from said craters and deposited on the floor of said chamber.

4,135,451

FUZE PLUG, PARTICULARLY FOR USE IN A HAND GRENADE

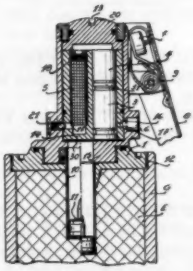
Maurice Rusbach, Nyon, Switzerland, assignor to Sarmac S.A., Geneva, Switzerland

Filed May 3, 1977, Ser. No. 793,434

Claims priority, application Switzerland, May 28, 1976, 6751/76

Int. Cl.[2] F42B *27/02*

U.S. Cl. 102—64 **6 Claims**



1. Fuze plug, particularly for a hand grenade, comprising a body and a casing extending from said body, housing a fixed percussion point, intended to be screwed on a grenade, characterized by the fact that said body houses an angularly displacable drum with respect to said body; in that this drum comprises two axial bores, one of the bores containing a detonator and a propulsive charge whereas the other contains a pyrotechnic timer; in that the drum comprises a radial passage way through its wall leading to the bore containing the pyrotechnic timer, this passage way being in active position of the fuze plug in front of a bore of the body giving access to a housing containing a primer.

4,135,452

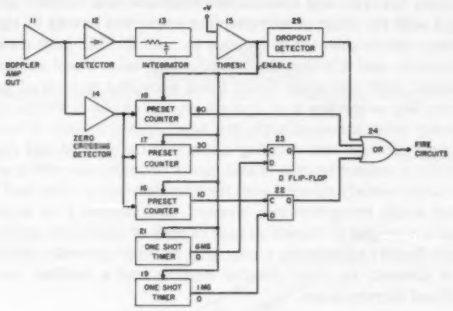
TIME DELAY COMPUTER USING FUZE DOPPLER FOR AIR-TO-AIR MISSILES

Lloyd E. Kinsey, and Gregory C. Roush, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 9, 1978, Ser. No. 868,157

Int. Cl.[2] F42C *13/04*

U.S. Cl. 102—214 **11 Claims**



1. An electronic device for detonating an explosive charge comprising:

signal means for providing a wave train which has been reflected from a target,

converting means, electrically connected to said signal means, for altering said reflected wave train;

enabling means, electrically connected to said converting means, for transmitting a pulse when said wave train has reached a predetermined amplitude,

reckoning means, electrically activated by said enabling means, for analyzing the frequency of said wave train; and

triggering means, electrically connected to said reckoning means, for releasing an electrical pulse;

whereby said electrical pulse activates firing circuits.

4,135,453

MOTORIZED BOGIE

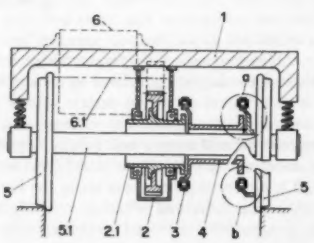
Wilhelm Koch, and Hans Jund, both of Heidelberg, Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 18, 1976, Ser. No. 742,848

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555031

Int. Cl.[2] B61C *3/00, 9/44, 9/52;* B61F *3/04*

U.S. Cl. 105—131 **8 Claims**



1. A transmission assembly for a vehicle including frame means, motive power means on said vehicle for driving said vehicle, and wheel-and-axle means having said frame means mounted thereon receiving power from said motive power means to effect movement of said vehicle, said transmission assembly being fixed to said frame means and connected be-

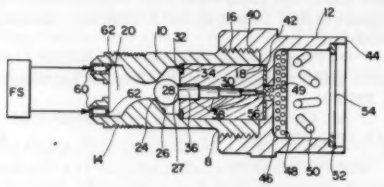
tween said motive power means and said wheel-and-axle means for transmitting motive power therebetween for driving said vehicle, said transmission means comprising hollow transmission shaft means arranged in generally coaxial relationship with the axle means of said wheel-and-axle means and having said axle means extending therethrough, hollow Cardan shaft means, and a pair of articulated coupling assemblies each comprising, respectively, a plurality of rigid levers and flexible joint means, with one of said coupling assemblies having its rigid levers interconnected at its ends by said flexible joint means between said transmission shaft and said Cardan shaft and with the other of said coupling assemblies having its rigid levers interconnected at its ends by said flexible joint means between said Cardan shaft means and said wheel-and-axle means, with said rigid levers being provided in each of said coupling assemblies in at least plural sets of plural levers, said levers being arranged such that when rotary motion is transmitted through said coupling assemblies one-half of said rigid levers in respective ones of said pair of coupling assemblies will be compressivly stressed with the complementary other half of said levers being tensively stressed, said flexible joint means being arranged at respective ends of each of said levers, each of said flexible joint means comprising an inner generally spherical element, an outer annular member and a resilient layer affixed therebetween.

4,135,454

SAFING A FLUERIC CARTRIDGE INITIATOR

Joseph W. Morris, Indian Head, Md., and Vincent P. Marchese, Morris Plains, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1977, Ser. No. 833,216
Int. Cl.[2] F42C *5/00*
U.S. Cl. 102—205 **12 Claims**



1. In combination with a flueric cartridge initiator of the type wherein a housing being defined by aft and forward ends, includes a convergent-divergent nozzle axially incorporated through said aft end, a transverse vent passing through the divergent zone of said nozzle and axially oriented with said nozzle, a resonance tube having a plurality of resonance cavities aligned in decreasing size order along the longitudinal axis of said resonance tube, and wherein a pyrotechnic transfer charge in juxtaposition with said resonance tube is ignited by thermal energy generated as a gas introduced into said flueric cartridge initiator through said nozzle undergoes periodic compression and expansion within said resonance cavities, the improvement which comprises:

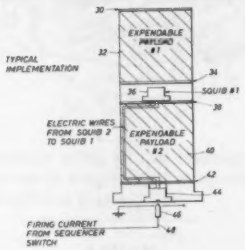
a Boolean AND logic element located within said nozzle whereby said initiator is safed against inadvertent ignition of said transfer charge.

4,135,455

MULTIPLE PAYLOAD CARTRIDGE EMPLOYING SINGLE PAIR OF ELECTRICAL CONNECTIONS

David W. Wallace, Austin, Tex., assignor to Tracor, Inc., Austin, Tex.

Filed Feb. 3, 1977, Ser. No. 765,245
Int. Cl.[2] F42C *11/00;* **F42B** *13/50*
U.S. Cl. 102—217 **14 Claims**



1. A multiple payload cartridge connectable for separate ignition of the payloads therein through two connecting wires, comprising:

a first expendable payload within the cartridge including a first squib,

a second expendable payload within the cartridge including a second squib,

ignition means pulsed through the connecting wires connected to said first and second squibs including means for disenabling said second squib from ignition by an applied first pulse thereto suitable for igniting said first squib and enabling said second squib for ignition by an applied second pulse, and

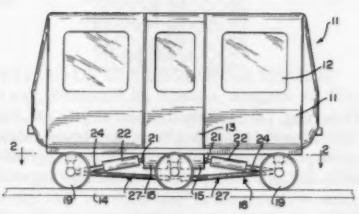
said ignition means including a switch through which the ignition pulses are applied, said switch being initially connected to said first squib and disconnected from said second squib and being operable by the first applied pulse to be connected to said second squib, said switch including a sensor for sensing the pressure of the first applied pulse and actuating the contacts of the switch to be connected to said second squib, said first and second squibs being capable of actuation by voltages of the same polarity.

4,135,456

POWERED RAILWAY CAR STEERING ASSEMBLY

Patrick G. Welsh, Glen Ellyn, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 26, 1977, Ser. No. 800,686
Int. Cl.[2] B61F *3/06, 5/22, 5/30, 5/46*
U.S. Cl. 105—135 **12 Claims**



1. A railway car having a body,

a drive motor means to power said car, a pair of first axles including flanged drive wheels mounted on said first axles,

means connected said first axles at opposite ends of said body for pivotal steering movement of said first axles about vertical axis,

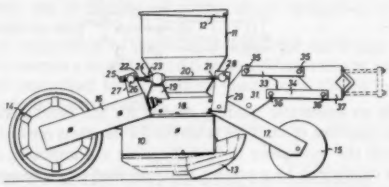
a second axle having flanged wheels positioned on said body between said first axles,
means connecting said second axle to said body for relative transverse guiding movement; the improvement of a steering arrangement for said first axles comprising:
two pairs of longitudinally extending and laterally spaced telescoping actuating members,
means pivotally connecting first ends of each of said pairs of actuating members to said second axle,
means connecting the other ends of said respective pairs of actuating members to said first axles, and
each actuating member being operatively inter-reactive with the others whereupon transverse guiding movement of said second axle urges extension of one of said pairs and corresponding retraction of the other in response to track curvature to provide relative steering movement to said first axles and drive wheels in relation to the curve.

4,135,457

SEED DRILLING UNITS

Robert A. Willis, Hythe, England, assignor to Hestair Stanhay Limited, Ashford, United Kingdom

Filed Jun. 27, 1977, Ser. No. 810,467
Claims priority, application United Kingdom, Jan. 12, 1977, 1125/77
Int. Cl.[2] A01C *5/00*
U.S. Cl. 111—52 **6 Claims**



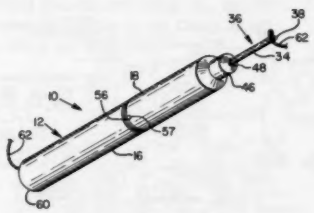
1. In a towable seed drilling unit of the type comprising:
a seed hopper;
a seed chamber communicating with said seed hopper and having a floor formed by a portion of the lower run of an endless belt which is perforated by at least one row of holes along its length, each hole in said belt being sized to contain a single seed;
a masking plate located below said endless belt and arranged to unmask at least one hole in said endless belt through which a seed may fall;
a coulter located beneath said seed chamber for forming a furrow ahead of said unmasked hole;
a furrow closing member located behind said seed chamber for closing said furrow formed by said coulter;
a ground contacting front wheel located in front of said coulter;
a ground contacting rear wheel located behind said furrow closing member;
drive means operably associated with said rear wheel and with said belt for driving said lower run of said endless belt in a direction opposite the direction in which said towable seed drilling unit is towed;
a first arm adapted to carry said front wheel and being pivotal about a first substantially horizontal axis;
a second arm carrying said rear wheel and being pivotal about a second substantially horizontal axis; and
means for adjusting the attitude of the first and second arms relative to the remainder of the unit thereby to adjust the penetration depth of the coulter;
the improvement wherein said towable seed drilling unit includes a main frame supporting the said front and rear wheels, a four-bar parallel linkage having a front connecting means adapted for connection to a towing vehicle tow bar, a shaft member pivotally connected to said main frame and forming a rear bar of said parallel linkage oriented parallel to said tow bar, and detachable means for locking said member to said main frame to render said parallel linkage static relative to said tow bar whereby the penetration depth of said coulter is determined by said adjusting means, said detachable means being operable selectively to release said member from said main frame and said front wheel being removable from said unit to render said parallel linkage freely pivotable relative to said tow bar whereby the penetration depth of said coulter is determined by the relation of the towing vehicle to said towable seed drilling unit.

4,135,458

NEEDLE HOLDER

Constantin Samoilov, 237 N. Front St., Woodburn, Oreg. 97071

Filed Dec. 9, 1977, Ser. No. 859,202
Int. Cl.[2] D05C *15/06*
U.S. Cl. 112—80 **12 Claims**



1. A holder for an embroidery needle or the like having a needle shank extending from a needle point to a rimmed needle handle, said holder comprising:
an elongated body divided transversely along its length into a forward needle-retaining portion and a rearward handle portion,
said retaining portion comprising wall means defining a bed for the needle and a narrow passageway extending forwardly from the bed to a forward end of said retaining portion for receiving the needle shank,
said wall means extending lengthwise of said retaining portion and terminating at opposed upper edges to define an access opening to said bed and passageway,
said bed including a bed surface having a series of longitudinally spaced-apart transversely extending grooves to seat the rim of a needle handle at selected positions along the length of said bed so as to control the extent to which the needle shank and tip project from the forward end of said retaining portion,
and a cap means for enclosing said bed and passageway to retain said needle in a selected position, said cap means being longitudinally separable from and adapted to be slidably received over said wall means and including a forward end opening through which the shank and tip of a needle retained in said bed projects.

9. In combination, an embroidery needle and needle holder therefor,
said embroidery needle including a hollow shank portion terminating at a point at one end and at an enlarged handle at the other end, said handle having a pronounced radial rim,
said needle holder including a forward needle-retaining portion and a rearward handle portion,
said retaining portion including wall means defining a bed removably receiving said needle handle portion and a narrow passageway extending forwardly from said bed to a forward end of said retaining portion removably receiving said needle shank portion,
said bed including a bed surface having longitudinally spaced transverse grooves for removably receiving the

rim of said needle handle to restrain said needle against longitudinal movement within said retaining portion,

said wall means terminating at laterally opposed longitudinally extending upper edges to define an access opening for inserting and removing said needle from said bed and passageway,

and cap means slidably receivable over said wall means for enclosing said bed and passageway and thereby retaining said needle rim in a selected one of said grooves.

4,135,459

AUTOMATIC SEWING MACHINE

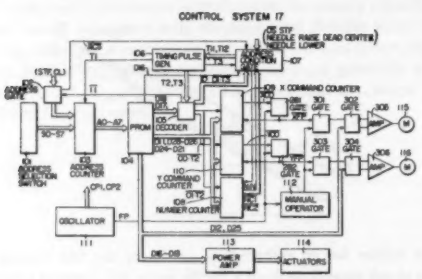
Takao Manabe, Sunto; Shinji Machi, Mishima, and Sigetugu Matunaga, Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,485

Claims priority, application Japan, Oct. 17, 1975, 50-125671

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.12 **7 Claims**



2. An automatic sewing machine comprising a stationary table, a head of the sewing machine mounted on said table and including a needle and driving means for vertically reciprocating said needle, a support carrying a clamping member adapted to clamp a cloth to be sewed, a pair of pulse motors for moving said support to any position defined by X and Y rectangular coordinate axes, and a control system for supplying driving pulses to said pulse motors for sewing said cloth according to a seam of a predetermined profile, and for supplying control signals to said driving means for vertically moving said needle and stopping the same at a upper dead center;

said control system including a memory device in which is stored information regarding the number of operations to be repeated, regarding control signals which reciprocate said needle, thread cutting and needle stop at said upper dead center, regarding the number of pulses required to drive said pulse motors for moving said support by one sewing pitch in X and Y directions of said rectangular coordinates and regarding the repeating numbers of a sewing stitch in said directions;

a timing pulse generator for generating a plurality of timing pulses, one of said timing pulses being used to determine a timing of reading the information stored in said memory device;

an address counter operated by another timing pulse generated by said timing pulse generator for designating an address of information to be read;

an address condition gate circuit which operates to determine whether information at a new address of said memory device is to be read or the information at the same address is to be read repeatedly; and

counter means for processing read out information to determine the amount of movement of said support at one sewing pitch in X and Y directions, and to set the number of repeating operations;

said counter means including an X command counter, a Y command counter and an operation number counter which are controlled by said one timing pulse to be set with information read out from the address of said memory device, said operation number counter being connected to be controlled by an output of said address condition gate circuit for repeatedly setting said informations in said X and Y command counter each time when these counters count out.

4,135,460

AUTOMATIC GUIDING DEVICE FOR THE WORKPIECE ON A SEWING MACHINE

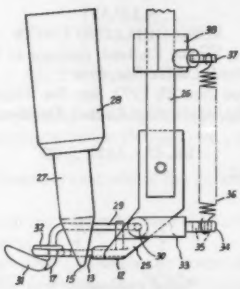
Gerard Biotteau, Saint-Pierre-Montlimart (Maine et Loire), France, assignor to Societe Anonyme Manufacture Francaise des Chausssures Eram, France

Filed Apr. 15, 1977, Ser. No. 787,923

Claims priority, application France, Apr. 21, 1976, 76 11707

Int. Cl.[2] D05B *35/10*

U.S. Cl. 112—153 **5 Claims**



1. In an automatic guiding device for the workpiece in a sewing machine of the type wherein the needle is moved laterally with the workpiece to feed the same and imposing a drag on the workpiece by a presser foot and feed dogs, comprising a guiding pressure inducing member adapted to bear upon the workpiece, an abutment member mounted laterally toward the inside and sligthly in advance of the stitching needle, a sensor for detecting the position of the edge of the workpiece, said sensor being disposed in advance of the abutment member, means controlled by the sensor for pressing the guiding pressre inducing member onto the workpiece in order to rotate the workpiece on a work-plate of the sewing machine when its edge is beyond a predetermined position measured perpendicular to the stitching path, and a pressure inducing foot bearing upon the workpiece in order to press the workpiece onto the work-plate and to hold the workpiece when the stitching needle and presser foot and claws return backward, the pressure inducing foot rising during forward movement of the stitching needle; the improvement in which said pressure inducing foot has, in its edge adjacent the presser foot, a recess through which passes the stem of the guiding pressure inducing member, said stem having its lower end dome-shaped and pressing directly the workpiece onto the plane surface of the work-plate.

4,135,461

STITCH PATTERN SELECTION AND DISPLAY ARRANGEMENT FOR SEWING MACHINES

Robert Sedlatschek, Bridgewater, N.J., assignor to The Singer Company, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,470

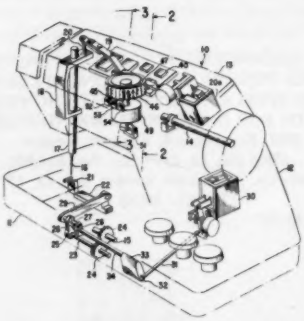
Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 E **6 Claims**

1. A stitch pattern selection and display arrangement for use in a sewing machine including memory means for storing selectively retrievable stitch pattern information, said arrangement comprising:

a graphic pattern display element having a plurality of substantially equal size stitch pattern image areas thereon;

a display window of sufficient dimension to permit at least one of said image areas to be viewed therethrough;
a stepping motor including a shaft;
means for mounting said display element on said stepping motor shaft;
operator influenced stepping motor control means for controlling said stepping motor to rotate said shaft so that an operator desired one of said pattern image areas is visible in a predetermined position through said window;



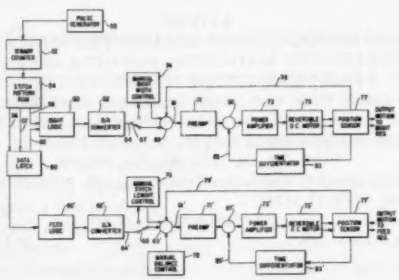
means for sensing the angular position of said stepping motor shaft and providing an output signal indicative of said position; and
means responsive to said output signal for retrieving from said memory means stored information to form the pattern corresponding to the pattern image area visible in said predetermined position.

4,135,462

X-Y PATTERNING BY ELECTRONICALLY CONTROLLED HOUSEHOLD SEWING MACHINE

Jack Brown, Union, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 881,948
Int. Cl.[2] D05B *3/00, 27/20*
U.S. Cl. 112—158 E **3 Claims**



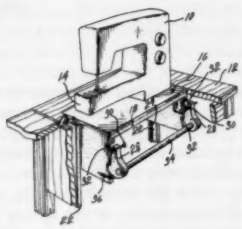
1. In a sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range to produce a pattern of successive feed and bight controlled stitches, said instrumentalities including a needle carrying bar supported for selective lateral jogging movement and for endwise reciprocation alternately to move a needle carried thereby into and out of engagement with a work material being sewn and including a work material feed system effective to feed a work material at a selective rate in a selected longitudinal direction substantially perpendicular to said lateral jogging movement of said needle carrying bar when said needle is out of engagement with said work material; electronic means for storing pattern stitch information; signal means operating in timed relation with the sewing machine for recovering selected pattern stitch information from said electronic storing means; feed actuating circuit means including an actuator; and bight actuating circuit means including an actuator responsive to said selected feed and bight pattern stitch information, respectively, for positioning said stitch forming instrumentalities to produce a pattern of stitches corresponding to the selected pattern stitch information; wherein the improvement comprises:
means for storing supplemental pattern stitch information for positioning said needle carrying bar when said needle moves into engagement with said work material, and
means for applying said supplemental pattern stitch information to said actuator of said bight actuating circuit means while said needle is in engagement with said work material.

4,135,463

MOUNTING ARRANGEMENT FOR A SEWING MACHINE

Réjean Lacasse, 167 St. François St., St. Pie de Bagot, Canada

Filed Dec. 21, 1977, Ser. No. 863,577
Int. Cl.[2] A47B *81/00;* **D05B** *75/00*
U.S. Cl. 112—217.1 **2 Claims**



1. An arrangement for mounting a sewing machine having a free arm in a sewing machine cabinet, comprising:
(a) a vertically movable base for receiving the sewing machine, said base consisting of a table top and depending side plates and back plate;
(b) a guide means vertically mounted on opposite side of the base for guiding the base in its movement between two vertical positions, said guide means consisting of an elongated key element fixed to each side of the cabinet and adapted to slide in a corresponding groove in each side plate of said base;
(c) spring means joining the base and the cabinet for counterbalancing the weight of the sewing machine, said spring means consisting of a casing secured to said back plate and a coiled flat spring housed in said casing, the free end of said flat spring being attached to the cabinet top; and
(d) indexing means mounted on the cabinet for engaging said base so as to position the base at any one of said two positions, said indexing means including two stops each pivoted at its top end to the respective side of said cabinet in a vertical plane containing the side plates of said base and for movement toward and away from said side plates, said two stops being joined together at their lower end by a horizontally extending handle-bar located at a distance under the front edge of said cabinet and facing the operator for easy access thereto, each stop having an upwardly facing tooth at its rear edge and formed at the lower end of said stop and at the level of said cross-bar, each side plate having a set of two vertically spaced and downwardly facing teeth each for complementary engagement with the tooth of the associated stop for positioning the base in either of said two positions, each set of two teeth being formed at the front edge of each side plate, and biasing means in the form of a tension spring attached to the lower end of a stop and to the cabinet and biasing said

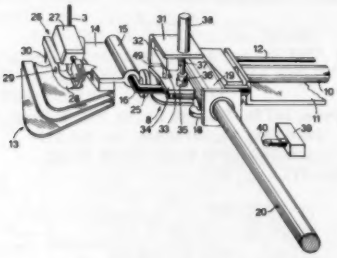
stops to an engaged position with said teeth of said side plates.

4,135,464

SEWING UNIT FOR JOINING SUPERIMPOSED LENGTHS OF CLOTH

Robert Sanvito, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Jan. 27, 1978, Ser. No. 872,974
Claims priority, application Italy, Feb. 4, 1977, 19962 A/77
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.15 **4 Claims**



1. An apparatus for guiding superimposed layers of cloth to be seamed having intersecting seams in a sewing unit of the type having a work surface with a sewing machine mounted thereon which includes a stitch forming needle and feed mechanism defining the sewing axis, said apparatus comprising:

(a) a slidable guide (**8**) mounted on the work surface for movement perpendicular to the sewing axis to and from an operating position adjacent the needle;

(b) a companion guide (**13**) slidably mounted on the work surface for movement parallel with the sewing axis to and from an operating position adjacent the needle;

(c) gripping means (**26**) pivotably attached to said companion guide (**13**) for engaging the cloth therein and moving said guide (**13**) toward the needle;

(d) actuating means defining a pneumatic cylinder (**10**) operatively connected to said slidable guide (**8**) for moving the latter between operative and inoperative positions;

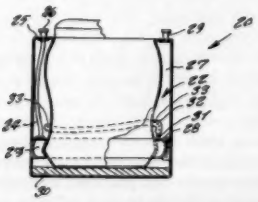
(e) switch means (**39**) connected to said actuating means and disposed for activation by said companion guide (**13**) to move said slidable guide (**8**) to its inoperative position and permit said guide (**13**) to continue movement into operating position adjacent the needle.

4,135,465

TANK FOR FUEL TANKER

Fred T. Dudley, George Spector, both of 3615 Wooolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jan. 11, 1977, Ser. No. 758,465
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 A **1 Claim**



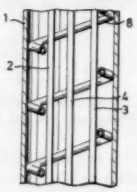
1. A tank assembly for installation inside a hold of an oil tanker vessel, said assembly comprising a fuel tank and a material around said tank that fits in a sealed space between an outer side of said tank, and an inner side of said hold wherein said material comprises an inflatable collar around said tank, said collar being connected by a hose to a capped inlet at a weather-deck of said vessel, a second capped inlet for communication with said sealed space and a valve on said collar connected to a perforated hose that is closed at its ends, removable caps on both said inlets, said inlet to said collar receiving exhaust gas and said inlet to said space adapted to receive sprayed in foam.

4,135,466

ARRANGEMENT FOR DAMPENING SOUND-VIBRATIONS IN ELONGATE HOLLOW MEMBERS SUCH AS MASTS OF SAILING VESSELS AND METHODS FOR DAMPENING SOUND-VIBRATIONS

Gunnar B. Häll, Karnvägen 8, Kungsör, Sweden

Filed Jul. 12, 1977, Ser. No. 814,902
Claims priority, application Sweden, Jul. 15, 1976, 7604558
Int. Cl.[2] B63B *15/00*
U.S. Cl. 114—90 **15 Claims**



2. An arrangement for dampening sound vibrations comprising:

a hollow mast;

a line extending longitudinally outside said mast;

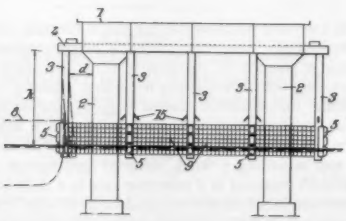
means for dampening sound emitted from and vibrations in said mast generated by the line slapping against the outside of said mast, said means including a substantially helical device arranged in said mast so as to abut an inner surface thereof.

4,135,467

MEANS OF PROTECTION AGAINST THE SHOCKS OF SHIPS COMING ALONGSIDE, PARTICULARLY FOR PLATFORMS OF THE OFF-SHORE TYPE

René Loire, Paris, and Daniel Guillaume, Rueil-Malmaison, both of France, assignors to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., Boulogne, France

Filed Apr. 28, 1977, Ser. No. 791,686
Claims priority, application France, Apr. 30, 1976, 76 12954; Apr. 19, 1977, 77 11711
Int. Cl.[2] B63B *21/04, 21/00*
U.S. Cl. 114—219 **15 Claims**



1. A shock-absorbing system for protecting against impacts of obstacles such as ships and the like, structures such as platforms of the off-shore type wherein a deck is mounted at a

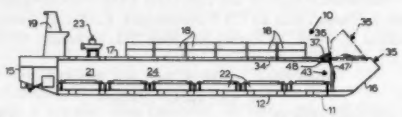
predetermined height above the level of the sea on a support structure constituted by piles or the like, said system comprising deformable shock-absorbing elements suspended from the deck between the deck and a level at least substantially equal to a predetermined level of the sea, on the outside of the support piles and at a suitable distance therefrom, said shock-absorbing elements being arranged to form a row with each element being spaced apart from the others, said row of elements extending along the periphery of said platform, and barrier means, comprising a substantially vertically extending barrier surface, provided between adjacent ones of said elements taken two at a time and comprising a sheet-like element of substantial vertical extent, for preventing an obstacle, such as a ship arriving in a head-on path between said elements, from passing through said row of shock-absorbing elements and coming into contact with said support piles.

4,135,468

BARGE-CARRYING WATERBORNE VESSEL AND TRANSPORTATION METHOD

William E. Kirby, Victoria, Hong Kong, and David J. Seymour, Daly City, Calif., assignors to Wharton Shipping Corporation, Edificio Vallarino, Panama

Continuation-in-part of Ser. No. 701,696, Jul. 1, 1976, abandoned. This application Mar. 9, 1977, Ser. No. 775,936
Claims priority, application India, Jul. 13, 1976, 1259/76; Pakistan, Jul. 8, 1976, 247/76; Taiwan, Jul. 6, 1976, 6511386
Int. Cl.[2] B63B *35/40*
U.S. Cl. 114—260 **12 Claims**



1. A barge-carrying waterborne vessel including in combination:

a hull with rigid supporting and hull-reinforcing structure, a bow, a stern, and side walls providing a series of buoyancy compartments, said hull having a hollow interior defining at least one hold extending most of the length of said vessel and having a bottom,

hold-flooding means for enabling passage of water from the sea into said hold,

pumping means for pumping water from said hold to dry out said hold,

upwardly-opening gate means at the bow end of said vessel for flotation loading of said hold when said hold is partially flooded, with a plurality of buoyant cargo carriers such as barges, lighters and pontoons placed by flotation loading through said gate means into predetermined locations within said hold,

collision bulkhead means located adjacent said gate for closing said hold off in a watertight manner, said collision bulkhead means being pivoted at its upper end,

opening and closing means for moving said collision bulkhead means upwardly about its pivot so as to enable said flotation loading and unloading of said vessel, and

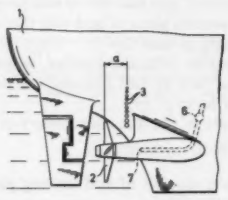
hold-down means for holding each said carrier down against the bottom of said hold to prevent movement thereof and to enable exchange of buoyancy between said carrier and said vessel when water is in said hold.

4,135,469

METHOD FOR REDUCING PROPELLER NOISE

Martti Rimppi, Tapiola, and Olavi Turunen, Helsinki, both of Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Continuation of Ser. No. 433,497, Jan. 15, 1974, abandoned. This application Mar. 24, 1977, Ser. No. 780,996
Claims priority, application Finland, Jan. 19, 1973, 73136
Int. Cl.[2] B63B *35/00*
U.S. Cl. 114—270 **6 Claims**



1. A ship having at least one driving propeller and an upwardly sloping hull portion above the propeller and including a device for reducing vibration and noise caused in said ship by said driving propeller, said device comprising powered means for forcibly blowing gaseous medium through gas blowing openings into a space between said propeller and the hull of the ship in which gas blowing openings at different levels have different areas in dependence on their location depth, the openings at a deeper level having larger areas, thereby providing a compensation for flow differences due to different discharge speeds caused by unequal hydrostatic pressure outside said openings for overcoming the water pressure outside said openings, said means producing air bubbles in said space and being dimensioned to produce a total flow of said gaseous medium in conformance with the formula:

$$\frac{B \cdot D}{Q} \cdot \sqrt[3]{\frac{P}{S \cdot Z}} < 0.4,$$

wherein, for a single propeller ship

B = the cosine of the average angle of inclination of the outer surface of said hull above said propeller as measured in a cross-sectional plane of said ship through said gas blow openings, at least 0.6

D = the diameter of said propeller, in meters

Q = the total flow of said gaseous medium, in normal cubic meters per hour

P = the power of the drive machinery of said ship, in shaft horsepower

S = 1

Z = the blade number of said driving propeller, and for a multipropeller ship,

D = the average diameter of the driving propellers of said ship, in meters

S = the number of driving propellers of said ship

Z = the blade number of anyone of said driving propellers

B = S, and

P and Q are as defined above for a single propeller ship.

5. A method for optimizing the dimensioning of a device for reducing vibration and noise caused in a ship by the driving propeller of said ship, said device including powered means for forcibly blowing gaseous medium through gas blowing openings to a space between said propeller and the hull of said ship in which said gas blowing openings are at different levels, said method including the steps of: feeding the gaseous medium to said openings in groups, each group being limited to openings located substantially at the same level, and setting a different feed pressure for each group for overcoming the water pressure outside the openings, further including dimensioning said powered means and necessary conduits for leading said gaseous medium to said space, so that said means delivers to said

space, gas bubbles produced by a total flow of gaseous medium in conformance with the formula:

$$\frac{B \cdot D}{Q} \cdot \sqrt[3]{\frac{P}{S \cdot Z}} < 0.4,$$

wherein, for a single propeller ship,

B = the cosine of the average angle of inclination of the outer surface of said hull above said propeller as measured in a cross-section plane of said ship through said gas blowing openings, at least 0.6

D = the diameter of said propeller, in meters

Q = the total flow of said gaseous medium in normal cubic meters per hour

P = the power of the drive machinery of said ship, in shaft horsepower

S = 1

Z = the blade number of said driving propeller, and for a multipropeller ship,

D = the average diameter of the driving propellers of said ship, in meters

S = the number of driving propellers of said ship

Z = the blade number of anyone of said driving propellers

B = S, and

P and Q are as defined above for a single propeller ship.

4,135,470

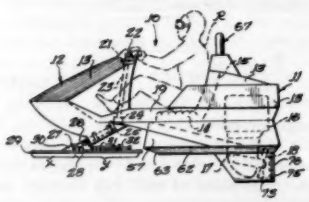
AQUATIC VEHICLE

Hiroshi Ono, 4326 W. Division St., Chicago, Ill. 60651

Continuation-in-part of Ser. No. 286,715, Sep. 6, 1972, abandoned. This application May 3, 1974, Ser. No. 466,802

Int. Cl.[2] B63B *35/72*

U.S. Cl. 115—70 **28 Claims**



1. An aquatic vehicle comprising a narrow vehicle body having floatation material secured thereto, steering means at the forward end of the body including a steering column and a steering shaft operatively connected to said steering column and projecting forwardly and downwardly of the vehicle body at an angle in the range of 40° to 75° from the vertical, a front ski member, a generally horizontal transverse pivot connecting the front ski member to the steering shaft at a point fowardly of the center of torque of the ski member, compression spring means on the front ski member and operatively connected to said steering shaft to yieldably bias the ski member to rotate towards an upwardly and forwardly inclined position, a flat plate defining the undersurface of the vehicle body, a rearwardly and downwardly inclined tapering tunnel formed in said plate longitudinally aligned with the front ski member and opening in a generally semi-circle at the forward edge of the plate spaced rearwardly of the front ski member and terminating adjacent the rear edge of the plate, a pair of outwardly extending and downwardly inclined longitudinal fins integral with said flat plate along the sides of the body and below the tunnel surface, a motor located in the body adjacent the rear end thereof, a depending drive shaft terminating in a propeller, anti-torque means cooperating with the propeller including a cowling encompassing the propeller and a pair of blades intersecting at right angles supported by the cowling behind the propeller, and a hollow air intake in the body communicating between the exterior of the body and the motor.

4,135,471

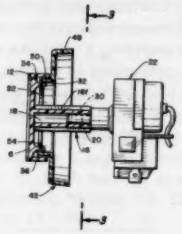
COMBINATION KNOB AND DIAL CONTROL FOR COLD CONTROL DEVICES

Darrel Wooldridge, Los Angeles, and Eugene T. McKinnon, Pacific Palisades, both of Calif., assignors to Gem Products, Inc., Santa Monica, Calif.

Filed Oct. 25, 1977, Ser. No. 844,804

Int. Cl.[2] G05G *1/12*; G09F *9/40*

U.S. Cl. 116—366 **8 Claims**



1. A universal knob-dial control member for association with the control shaft of a cold control regulator comprising the combination of: a knob member having an exterior, polygonal, planar portion and a circumferential skirt portion and an interior recessed portion having an integral, centrally extending boss, said boss having a central bore and being adapted to receive a control shaft of a cold control regulator, said interior recessed portion having spaced, locking pins adapted for selective releasable engagement with a dial member, said locking pins being integral with said interior recessed portion and have protuberances, at the terminii thereof and extending a distance less than the depth of said skirt portion.

4,135,472

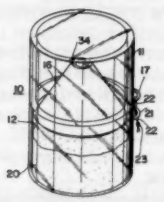
MISHANDLING DETECTOR FOR PACKAGES

Frank J. Chesla, Box 22 US Navcommsta, Keflavik, Iceland, and Gerald K. Wild, 14 Farley St., Box 232, Exmouth 6707, Australia

Filed Mar. 30, 1978, Ser. No. 891,887

Int. Cl.[2] G01P *13/02*

U.S. Cl. 116—124 R **4 Claims**



1. Apparatus for indicating whether an article to which it is attached has been tilted on its side or inverted comprising:

a vial having an upper and lower chamber;

a granular material contained in said lower chamber;

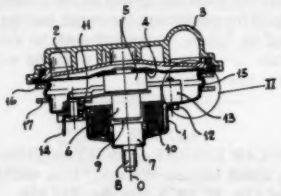
funnel means located within said vial and coupled between said upper chamber and said lower chamber the narrower portion of said funnel substantially projecting into said upper chamber, whereby the tilting or the inversion of said article to which said apparatus is attached will cause said granular material to pour through said funnel and become trapped between said funnel and the walls of upper chamber; and

fastener means coupled to said funnel whereby when said upper chamber and said lower chamber of said vial and said funnel are coupled together, said upper chamber may not be separated from said lower chamber without permanently damaging said fastener means.

4,135,473
VEHICULAR SOUND GENERATOR

Domenico Frigo, Olmo (Vicenza), Italy, assignor to F.I.A.M.M. S.p.A. - Fabbrica Italiana Accumulatori Motocarri Montecchio, Montecchio Maggiore (Vicenza), Italy

Filed Jun. 16, 1977, Ser. No. 807,331
Claims priority, application Italy, Nov. 11, 1976, 29245 A/76
Int. Cl.[2] G10K *9/04, 9/12;* H04R *31/00*
U.S. Cl. 116—142 R 7 Claims



1. In a vehicular warning device comprising a sound generator provided with a housing centered on an axis, a diaphragm transverse to said axis engaged by a peripheral zone of said housing with freedom of relative movement along said axis, an electromagnetic coil fixedly positioned in said housing and centered on said axis, a stationary core member in said housing extending axially into said coil from one end thereof, and a ferromagnetic armature carried on said diaphragm for vibrating same upon an energization of said coil with an intermittent current, said armature extending into said coil from the other end thereof and confronting said core member across an air gap,

the improvement wherein said housing is provided between said pheripheral zone and said core member with a corrugated wall portion bent into a peripheral bulge which is selectively further deformable by the application of external pressure upon said bulge for axially foreshortening said housing to narrow said air gap for maintaining the width thereof within predetermined limits.

4. In a vehicular warning device comprising at least one sound generator provided with a housing centered on an axis, a diaphragm transverse to said axis engaged by a peripheral zone of said housing with freedom of relative movement along said axis, a tubular boss centered on said axis and rigid with said housing at an entrance end of an air channel normally blocked by said diaphragm contacting said boss, biasing means secured to said housing and bearing upon said diaphragm for urging same toward said boss, and a source of air pressure trained upon said diaphragm for deflecting it from said boss against a restraining force exerted by said biasing means,

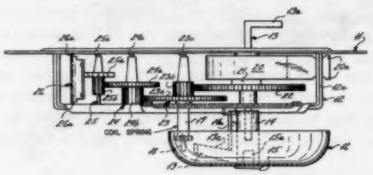
the improvement wherein said housing is provided between said peripheral zone and said core member with a corrugated wall portion bent into a peripheral bulge which is selectively further deformable by the application of external pressure upon said bulge for axially foreshortening said housing to intensify said restraining force and for minimizing air leakage through said boss.

4,135,474
BELL ACTUATING MECHANISM

Ruth Kaplan, 91 Schoolhouse La., Roslyn Heights, N.Y. 11577

Filed Sep. 15, 1977, Ser. No. 833,420
Int. Cl.[2] G01K *1/10*
U.S. Cl. 116—155 2 Claims

1. In the combination of a spring driven motor having a winding shaft which rotates less than one complete revolution during the unwinding of the motor from a fully wound condition, escapement means for permitting the motor to unwind at a controlled rate and a bell to be struck immediately proximate to completion of unwinding of the motor, an improved bell actuating mechanism comprising a bell post coaxially mounted at one of its ends on the winding shaft for rotation with the winding shaft, means coaxially mounting a gong bell onto the other end of the bell post for rotation with the bell post and winding shaft, a hammer for striking the bell, a spring mounting the hammer immediately adjacent an inner surface of the bell, an end of the spring remote from the bell being fixed relative to the bell, an arm integral with and extending outwardly from the bell post for rotation with the bell post and winding shaft, the path of movement of the arm intersecting the hammer and the hammer being rotationally so positioned

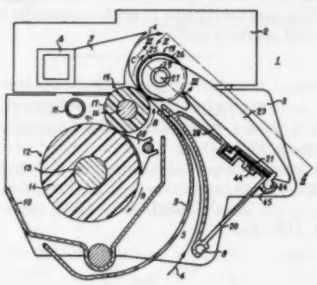


relative to the axis of the winding shaft and the bell post that the arm engages the hammer as the unwinding of the motor is completed, the arm being so shaped as to facilitate disengagement of the hammer, whereby as the unwinding of the motor is completed and the arm engages the hammer, the spring flexes until the flexure permits the arm to slide over the hammer whereupon unflexing of the spring throws the hammer against the inner surface of the bell.

4,135,475
APPARATUS FOR APPLYING LIQUID TO SHEETLIKE MATERIAL

Johannes P. Bömers, Grubbenvorst, Netherlands, assignor to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Oct. 26, 1977, Ser. No. 845,596
Claims priority, application Netherlands, Oct. 29, 1976, 7611988
Int. Cl.[2] B05C *1/08*
U.S. Cl. 118—249 9 Claims



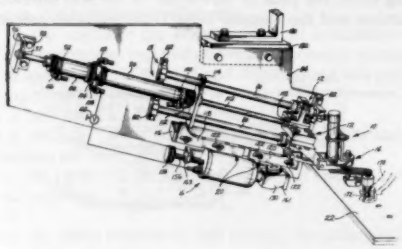
1. In an apparatus for applying a layer of liquid to sheetlike material, including a liquid application roller, means for supplying liquid to the application roller, a pressure roller for pressing the sheetlike material against the application roller and means for guiding sheetlike material to and from the nip between said rollers, the improvement wherein the pressure roller comprises a plurality of relatively short, axially aligned constituent rollers each disposed adjacent to at least one other and each rotatable independently of the others, means connecting together the respective adjacent ends of adjacent constituent rollers so as to keep them substantially coaxial yet permitting displacement of them relative to each other in radial direction and resilient means acting upon each said connecting means for yieldably urging said ends of adjacent constituent rollers toward the application roller.

4,135,476

SEALANT APPLICATOR

Josiah T. Duryea, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 1, 1977, Ser. No. 847,575
Int. Cl.[2] B05C *1/02, 7/06*
U.S. Cl. 118—259 **15 Claims**



1. An applicator for applying an annular bead of sealant to a wall of an aperture in a workpiece comprising:

an applicator head having a dauber rotatively mounted thereon, said dauber having an end and a flexible, convexly contoured applicator tip affixed to said end,

means associated with said applicator head for rotating said dauber,

a sealant supply including a reservoir and supply means for supplying said reservoir with sealant, said reservoir having an opening and a sealant-permeable member operably associated with said opening, said permeable member having a shearing surface communicating with the exterior of said reservoir, said supply means for supplying sealant to said reservoir to feed sealant through said permeable member to provide a predetermined amount of sealant evenly over said shearing surface,

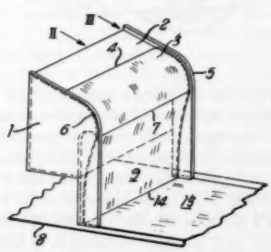
means associated with said applicator head for moving said applicator tip between a first position wherein said applicator tip contacts said shearing surface to receive an annular bead of sealant thereon and a workpiece engagement position wherein said applicator tip engages the aperture wall in said workpiece to apply an annular bead of sealant to said aperture wall.

4,135,477

CURTAIN COATING APPARATUS

Kenneth A. Ridley, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 615,340, Sep. 22, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,335
Int. Cl.[2] B05D *1/30;* **G03C** *3/00*
U.S. Cl. 118—325 **5 Claims**



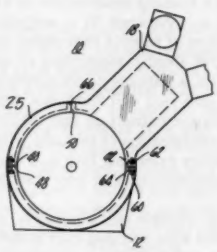
1. An apparatus for curtain coating, comprising: a coating hopper having an inclined surface terminating in a lip, the hopper further having a slot extending thereacross and opening into the inclined surface; a feed system coupled to said hopper for supplying a coating liquid through the slot to the inclined surface, the liquid issuing from the slot flowing as a layer down the inclined surface and beginning its fall after flowing over the lip and thereby forming a free-falling liquid curtain; a transport means for moving a web to be coated beneath the coating hopper; and two vertical edge guiding plates extending from the opposite ends of said lip to said web and having the opposed surfaces thereof parallel to the direction of movement of the web and having a dimension in said direction greater than the distance the liquid curtain will deviate from a vertical line from the lip due to the Coanda effect of the lip on the liquid for permitting the entire curtain including the edges thereof to follow its natural path to the web and causing the curtain to come in contact with the web along a straight transverse line thereacross.

4,135,478

MODULAR ENGINE CONSTRUCTION

Louis J. Rassey, 29048 Gloede, Warren, Mich. 48093

Filed Oct. 20, 1976, Ser. No. 733,996
Int. Cl.[2] F02B *75/16;* **F02F** *7/00*
U.S. Cl. 123—59 R **5 Claims**



1. A modular engine comprising:

a crankcase open at its top and forming a mounting flange along each upper side of the crankcase;

a crankshaft rotatably carried by the crankcase;

an engine block having a mounting flange formed along each side and positioned substantially vertically on said crankcase;

a pair of adapter plates, each having a mounting flange formed on each side, said adapter plates being positioned on the crankcase so that the mounting flanges of one adapter plate respectively register with one crankcase flange and one engine block flange whereby the flanges of the other adapter plate respectively register with the other crankcase and engine block flanges;

means for securing said registering flanges together;

wherein said engine block is adapted to reciprocally carry at least one piston member therein said piston member being operatively coupled to said crankshaft to effect the rotation of the crankshaft upon reciprocation of the piston member within the engine block, and

wherein each of said flanges are formed in substantially an axially extending radial plane with respect to the axis of the crankshaft, each of said flanges being substantially

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4,135,479

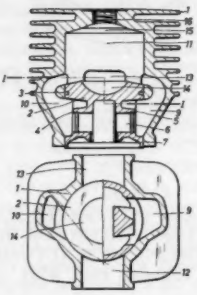
PISTON AND CYLINDER FOR TWO-CYCLE ENGINES

Johannes Reitz, Heilbronn; Erich Stark, Neckarsulm, and Dieter Schneck, Möckmühl, all of Germany, assignors to Karl Schmidt GmbH, Neckarsulm, Germany

Filed Dec. 16, 1976, Ser. No. 751,244
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557262
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—73 AA **5 Claims**

1. In a piston and cylinder for two-cycle engines wherein the fuel-air mixture is precompressed in the crankcase and flows to

the combustion chamber through transfer passages formed in the cylinder wall and under the control of the piston movement, and wherein the piston skirt is formed with openings adjacent the end faces of the piston pin, said piston pin being mounted in piston pin bosses carried by bearing brackets depending from the piston head and, when the piston is at its lower dead center, said openings register with the inlet openings of the transfer passages so that the precompressed fuel-air mixture then flows through the interior of the piston, through the openings in the piston skirt and through the transfer passages into the combustion chamber which comprises a depression volume, the improvement wherein the openings in the piston skirt have approximately the same size as the inlet open-



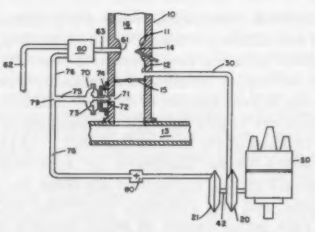
ings of the transfer passages which register with said openings when the piston is at its lower dead center, and the piston pin bosses have an aerodynamically favorable shape and are joined to the lower frame portions defining said openings and spaced apart as closely as possible whereas the depression volume of the combustion chamber is accommodated to a substantial extent in the piston head, wherein the aerodynamically favorable shape of the pin bosses includes the bearing brackets having an inwardly opening V-shaped cross-section, the pin bosses connected to the lower frame portions by members having a concave smooth arcuate outer surface and the pin bosses having a continuous arcuate outer surface envelope comprising a double convex and a double concave surface.

4,135,480

SPARK VACUUM ADVANCE CONTROL

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 521,035, Nov. 5, 1974, Pat. No. 4,040,401. This application May 13, 1977, Ser. No. 796,683
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.[2] F02P *5/04*; F02M *25/06*
U.S. Cl. 123—117 A **14 Claims**



1. In an ignition spark advance system for use with spark ignited internal combustion engines comprising in combination

(a) an ignition distributor having a spark advance mechanism operated by a first vacuum actuated spark advance means,

(b) a carburetor having a throttle plate and a spark advance port with said spark advance port located immediately upstream from said throttle plate,

(c) a vacuum line operably connecting said spark advance port with said first spark advance means,

(d) a vacuum actuated exhaust gas recycle valve, and

(e) an EGR vacuum amplifier having a vacuum line operatively connected to and adapted to modulate said exhaust gas recycle valve in response to operating conditions of said engine,

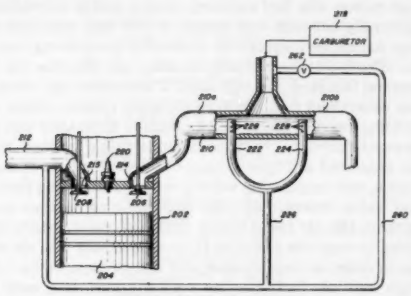
the improvement comprising a second vacuum actuated spark advance means, said second spark advance means being operatively connected to said EGR vacuum amplifier by said vacuum line and actuated by a vacuum signal from said EGR vacuum amplifier, said first and said second spark advance means cooperating in advancing the timing of said ignition spark advance system when said exhaust gas recycle valve is open.

4,135,481

EXHAUST GAS RECIRCULATION PRE-STRATIFIED CHARGE

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,213
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **3 Claims**



1. In an internal combustion engine having a combustion chamber, a carburetor for producing a fuel/air mixture, intake manifold and intake valve means for delivering a charge of said mixture to the combustion chamber, an ignition device for igniting the charge in the combustion chamber, and exhaust valve and exhaust manifold means for removing products of combustion from the combustion chamber; the improvement comprising:

(a) a stratifying device including a conduit containing a plurality of holes;

(b) said intake manifold having a portion thereof wherein flow therein is determined by whether said intake valve means is open or closed;

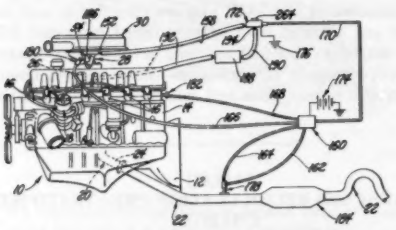
(c) said stratifying device being positioned in said intake manifold portion controlled in flow by said intake valve means such that the gas passes directly from said conduit through said holes in a direction transverse to the axis of flow within said intake manifold portion towards a wall of said intake manifold; and

(d) exhaust gas passage means connected between said exhaust manifold and said conduit, whereby when said intake valve is closed, exhaust gas enters said intake manifold through the holes of said stratifying device to produce a pocket of diluted exhaust gas in the intake manifold, and when the intake valve is open, the stratified charge delivered to the combustion chamber includes a layer of diluted exhaust gas.

4,135,482
APPARATUS AND SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE

Kenneth C. Bier, Bloomfield Hills, and Robert J. Miller, Warren, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,547
Int. Cl.[2] F02M *23/04, 21/02*
U.S. Cl. 123—119 EC **18 Claims**



1. A carburetor for a combustion engine, comprising induction passage means for supplying motive fluid to said engine, a source of fuel, main fuel metering system means communicating generally between said source of fuel and said induction passage means, idle fuel metering system means communicating generally between said source of fuel and said induction passage means, and selectively controlled modulating valving means effective to controllably increase and decrease the rate of metered fuel flow through each of said main fuel metering system means and said idle fuel metering system means, said modulating valving means being effective to so alter said rate of metered fuel flow in response to a single control signal means generated as a consequence of selected indicia of engine operation, said modulating valving means comprising first and second valve means, said idle fuel metering system means comprising idle air bleed means, said first valve means being effective to vary the effective flow area of said idle air bleed means in order to thereby alter said rate of metered fuel flow through said idle fuel metering system means, said main fuel metering means comprising metering restriction means, said second valve means being effective to vary the effective flow area of said metering restriction means to thereby alter said rate of metered fuel flow through said main fuel metering system means, said idle air bleed means comprising first and second air bleed orifices, and said first valve means being effective for varying the effective flow area of said first air bleed orifice.

4,135,483
FUEL FEED DEVICE

Frank A. Edwards, 42 Leeside Dr., Carmel, N.Y. 10512

Filed Sep. 20, 1976, Ser. No. 724,636
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—133 **11 Claims**

1. A fuel feed device for use with internal combustion engines, said fuel feed device comprising:

a mixing chamber;

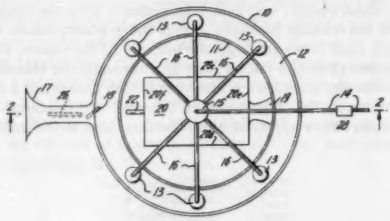
a plurality of stationary, equi-spaced liquid fuel absorbant storage members mounted within said mixing chamber, said absorbant members being inert to the liquid fuel delivered to them;

a liquid fuel line for supplying liquid fuel to said absorbant members through a liquid fuel diverter valve;

a port for concurrently admitting outside air into said mixing chamber;

a vapor tank having means at one end thereof communicating with said mixing chamber and means at the other end thereof through which gaseous vapors are delivered to said engine for combustion, said vapor tank containing a plurality of baffle plate members about which said gaseous vapors travel before entering said engine;

a liquid fuel release valve for regulating and controlling the



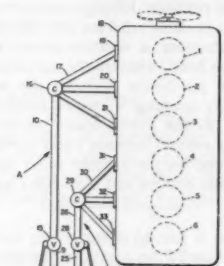
amount and pressure of the liquid fuel supplied to said absorbant members; and,

a choke valve for regulating and controlling the flow of gaseous vapors to said engine.

4,135,484
COORDINATED AND INTEGRATED FUEL AND AUXILIARY-EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINES FOR AUTOMOBILES

John O. Malott, 5565 Columbia Pike, #707, Arlington, Va. 22204

Filed May 24, 1977, Ser. No. 800,011
Int. Cl.[2] F02D *13/06*
U.S. Cl. 123—198 F **1 Claim**



1. In an internal combustion engine a coordinated and integrated fuel and auxiliary-exhaust system comprising; two fuel-line assemblies including their respective controls, two auxiliary-exhaust assemblies including their respective controls, said engine having an even number of cylinder, said cylinders being assigned numbers beginning with the assignment of number one to the cylinder at the front end of one tier of cylinders and said numbering being continued in numerical sequence throughout said tier and throughout any other tier of cylinders in said engine, and said cylinders comprising two groups of cylinders, each group having an equal quantity of cylinders, namely, group-one cylinders comprising those beginning with cylinder one in the cylinder block in which cylinder the firing sequence 1 occurs and group-one cylinders comprised of those additional cylinders in which alternately every other firing-sequence occurs thereafter totaling one-half of the entire number of firing-sequences that occur in the entire firing-sequence

cycle in the engine, and group-two cylinders comprised of all other cylinders in the cylinder block; one of the said fuel-line assemblies herein referred to as "fuel-line assembly A" controlling the feeding of fuel to group-one cylinders and the other fuel-line assembly herein referred to as "fuel-line assembly B" controlling the feeding of fuel to the group-two cylinders; each fuel-line assembly comprised of the following parts connected together in the following sequence with portions of fuel-line tubing, namely, fuel tank with fuel strainer, and a Y-joint (all of which serve both fuel-line assemblies), fuel pump, fuel valve, and carburetor, and also comprising; an intake manifold secured at one end orifice thereof to the carburetor and at the other end orifices to the cylinders head at the intake valve chambers of the respective cylinders that are fed by the respective fuel-line assemblies A and B; and each fuel-line valve to the control lever of said valve train in the vicinity of a steering wheel of an automobile, which controls lever when actuated, opens and closes the fuel-valve to control the flow of fuel in that particular fuel-line assembly from the fuel tank to the engine; the two fuel-line assemblies including their respective controls being able to conserve fuel with a system to transport, to permit, and to control the flow of fuel only to either the group-one or group-two cylinders that are fed fuel by the respective fuel-line assembly A or B, at a particular time, when sufficient; second, to transport, to permit, and to control as much as a full flow of fuel only to either the cylinders fed by fuel-line assembly A or B and a restricted flow to the cylinders fed by the other assembly, when desired; and third, to transport, to permit, and to control a full flow of the fuel to all cylinders only when needed; and said coordinated and integrated fuel and auxiliary-exhaust system also comprising, two auxiliary-exhaust assemblies, including their separate controls, one assembly herein referred to as "auxiliary-exhaust assembly C" for controlling the exhaust from the Group-one cylinders, that is, those fed by fuel-line assembly A, and the other assembly herein referred to as "Auxiliary-exhaust assembly D" for controlling the exhaust from the Group-two cylinders, that is, those fed by fuel-line assembly B; each auxiliary-exhaust assembly comprising, a flat sliding-plate valve base (which serves both auxiliary-exhaust assemblies C and D) and has a smooth, flat surface portion and is located on top of the engine's cylinder head and covers all of the cylinders and is as wide as the diameter of the pistons in the engine, said base being in a plane at right angles to the direction of the stroke of the engine's piston, said base having a separate orifice through same into the combustion chambers of each of the respective cylinders, the centers of said orifices being in a straight line over the centers of said respective cylinders, said orifices being auxiliary-exhaust valve openings for the respective cylinders; and each auxiliary-exhaust assembly comprised of a sliding-plate piston, each of said pistons being retained in and guided by means of a frame secured to the top of the cylinder head, each of said pistons being a straight, flat strip of smooth metal as long as the flat sliding-plate valve base and uniform in thickness and uniform in width except that one edge is indented with notches of equal length and width alternately with standing portions thereof, and which standing portions are also of equal length and width, said notches and standing portions constituting a series of auxiliary-exhaust valves on each of said flat sliding-plate pistons and each auxiliary-exhaust assembly also comprising an auxiliary-exhaust valve train from said piston to an auxiliary-exhaust-valve control lever in the vicinity of the steering wheel of the automobile, which levers when actuated, move the pistons with their auxiliary-exhaust valves back and forth over the orifices in said sliding-plate valve base to open and to close the auxiliary-exhaust valves; and the auxiliary-exhaust assemblies thereby providing a facility to open the auxiliary-exhaust valves of either group-one or of group-two cylinders when fuel is being fed to and power is being produced in only the other cylinders, and to close all auxiliary-exhaust valves when fuel is being fed to and power is being produced in all cylinders; and two auxiliary-exhaust assemblies, including their respective controls being able to minimize the loss of power, which loss would otherwise occur in creating compression in the non-power-producing cylinders; and whereby said coordinated and integrated system of fuel-line assemblies and said auxiliary-exhaust assemblies together with their respective controls operate as follows to conserve fuel in the operation of automobiles on highways:

(a) all auxiliary-exhaust valves should be closed and all fuel valves should be open to obtain maximum power, when needed;

(b) the fuel valve in one of the fuel-line assemblies should be open and the fuel valve in the other fuel-line assembly should be closed when the power derived from the cylinders that are being fed fuel is sufficient, and the auxiliary-exhaust valves for the non-power-producing cylinders should be open to minimize the loss of power, which loss would otherwise occur in creating compression in the non-power-producing cylinders; and

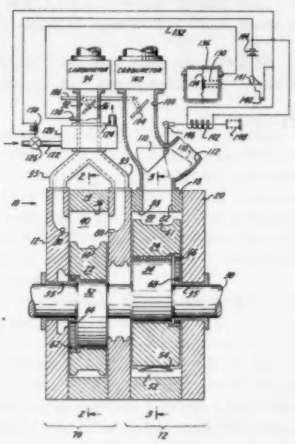
(c) to meet intermediate power requirements, close all auxiliary-exhaust valves, provide a full flow of fuel through one fuel-line assembly and as much of a flow through the other fuel-line assembly as may be desired.

4,135,485

SPLIT-MULTI-UNIT ROTARY COMBUSTION ENGINE

Robert W. Loyd, Jr., Wyckoff, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Jun. 21, 1977, Ser. No. 808,667
Int. Cl.[2] F02B 53/00
U.S. Cl. 123—242 **10 Claims**



1. A multi-unit rotary combustion engine comprising:

(a) at least two co-axial engine units;

(b) each engine unit including a housing having two axially-spaced side walls and a peripheral wall disposed between said side walls to form an internal cavity therebetween with the inner surface of said peripheral wall having a multi-lobe profile and said engine unit also including a rotor member having a generally polygonal periphery and mounted for rotation within said housing cavity with the apex portions of the rotor member periphery having sealing cooperation with said multi-lobe surface to form a plurality of engine working chambers;

(c) a common shaft for said engine units and extending through the housing cavities of said units, said shaft having a plurality of cylindrical eccentric portions, one for and disposed in each of said cavities with the rotor member for each cavity being journaled on the associated eccentric portion of said shaft;

(d) means for supplying fuel and air to the working chambers of each of said units, said means including an intake port for each unit and disposed for sequential communication

with the working chambers of said unit, the intake port for at least one of said units opening into the engine cavity through a side wall of said housing and the intake port for at least another of said units opening into its engine cavity through the multi-lobe inner surface of its housing peripheral wall, said engine unit or units with a peripheral wall intake port having a larger total volumetric capacity of the working chambers than the total volumetric capacity of the working chambers of the engine unit or units having a side wall intake port; and

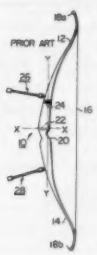
(e) means for shutting off the fuel only to an engine unit or units having its/their intake port opening through the peripheral wall when the engine is being operated below a predetermined engine power output.

4,135,486

ARCHERY BOW STABILIZER

Kouichi Enomoto, 1295-3, Futatsugi Matsudo-shi, Chiba-ken, Japan

Filed Oct. 22, 1976, Ser. No. 734,968
Claims priority, application Japan, Sep. 20, 1976, 51-111799
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—89 **7 Claims**



1. Apparatus comprising:

an archery bow having a centrally located handle, said handle having an outer periphery;

a stabilizing weight element;

a damper at least partially embedded in said handle of said bow and having its center of gravity located adjacent the longitudinal axis of the bow and positioned within the boundary of said outer periphery of said handle at the immediately adjacent area of attachment of the damper to the handle, said damper including a recess therein;

a support rod supporting said stabilizing weight element on one end thereof, the remaining end of said support rod being located within said recess to said damper and

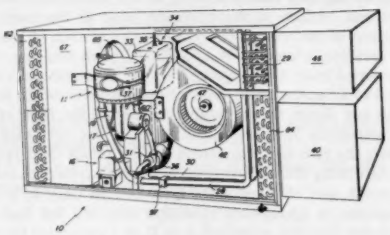
an elastic sleeve located in said recess between the walls of the recess of said damper and said other end of said support rod and at least partially within the boundary of said outer periphery of said handle, said elastic sleeve adapted to resiliently couple said support rod to said damper in such a manner that said bow is permitted to follow minor oscillations in an arrow shot by said bow substantially independently of the stabilizing effect of said weight element.

4,135,487

HEAT EXCHANGE CONTROL SYSTEM

Herbert G. Hays, Homestead, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Continuation of Ser. No. 608,939, Aug. 29, 1975, abandoned, which is a division of Ser. No. 436,231, Jan. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 185,631, Oct. 1, 1971, abandoned. This application Aug. 4, 1977, Ser. No. 821,899
Int. Cl.[2] F24H *6/00*
U.S. Cl. 126—110 R **7 Claims**



1. A heat exchange system comprising:

a first heat exchanger comprising a plurality of tubular members surrounding a central plenum having a plurality of thermally conductive members bonded thereto;

means for supplying the products of combustion to said first heat exchanger;

means for directing a fluid to be heated through said first heat exchanger;

the heat exchanging surface of said heat exchanger contacting said products of combustion being substantially greater than the heat exchanging surface area of the interior of said tubular members contacting said fluid;

a limit switch responsive to the temperature of said fluid in said heat exchanger for disabling said supplying means when said fluid temperature exceeds a first predetermined temperature; and

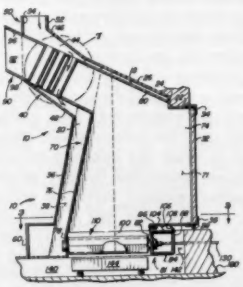
electrical heater means in said heat exchange relationship with said heat exchanger to maintain said fluid in said tubular members above a second predetermined temperature which is the effective dew point of flue gas in said heat exchanger during periods when said products of combustion are not being supplied to said heat exchanger.

4,135,488

FIREPLACE FURNACE APPARATUS

William T. Wells, 3930 W. Ajo Way, Tucson, Ariz. 85713

Filed Feb. 16, 1977, Ser. No. 769,384
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **11 Claims**



1. Fireplace furnace apparatus comprising, in combination:

inner enclosure means including a plurality of walls defining a firebox;

outer enclosure means including a plurality of walls disposed about and spaced apart from the inner enclosure means and defining a plurality of chambers between the inner enclosure means and the outer enclosure means;

upper duct means communicating with the plurality of chambers to provide a flow of circulating air comprising a first flow of air to the chambers for receiving heat from the plurality of walls of the inner enclosure;

lower duct means communicating with the plurality of chambers remote from upper duct means for transmitting the first flow of heated air from the chambers;

grate means disposed beneath the firebox and including

a plurality of noncylindrical rotatable hollow members communicating with the plurality of chambers for transmitting a portion of the first flow of air between some of the plurality of chambers and for supporting fuel for combustion in the firebox, and

means for rotating the rotatable hollow members between a first position in which portions of the hollow members are disposed adjacent each other for preventing a vertical flow of combustion air between the hollow members and a second position in which portions of the hollow members are spaced apart from each other to allow ash residue from the combusted fuel to fall beneath the grate means;

means for providing a flow of combustion air comprising a second flow of air over the grate means;

air valve means for controlling the second flow of combustion air over the grate means; and

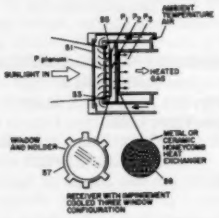
a combustion flue communicating with the firebox for removing the second flow of air from the firebox.

4,135,489

SOLAR ENERGY CONVERSION SYSTEM

Philip Jarvinen, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 11, 1975, Ser. No. 612,434
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **29 Claims**



1. A solar energy conversion system utilizing means for focusing solar radiation comprising:

a hollow bodied housing having an opening at one end;

a window disposed in said opening, said window being spaced from said focusing means and heated by the concentrated radiation from the focusing means;

a number of tubes in said housing;

means orienting said tubes such that focused solar radiation impinges on the open ends of said tubes and is internally reflected down said tubes until the majority of said radiation is absorbed at the walls of said tubes to heat them;

means for providing a flowing heat transfer medium under pressure in said housing; and,

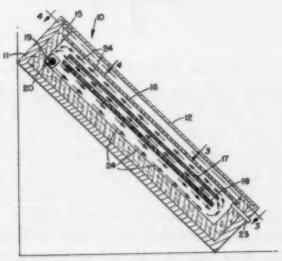
means for directing said flowing heat transfer medium over said window to cool said window by the transfer of heat from said window to said medium, thereby to prevent failure of said window due to the heating of the window by said concentrated radiation, and for directing said heat transfer medum into said tubes at the ends of said tubes at which said solar radiation impinges, such that the same heat transfer medium cools said window and removes heat from said tubes.

4,135,490

RECIRCULATING NATURAL CONVECTION SOLAR ENERGY COLLECTOR

Bertrand S. Soleau, Jr., 4203 Kincaid Ct., Chantilly, Va. 22021

Filed Dec. 14, 1976, Ser. No. 750,444
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **16 Claims**



1. An air convection solar collector comprising:

a housing having a front side, a back side wall, a first side wall, a second side wall, a top side wall and a bottom side wall, said back side wall, said first side wall, said second side wall, said top side wall and said bottom side wall being secured together in such a manner that said housing is closed on all said sides except the front side, said front side being open;

a plate made of a suitable solar transparent material. said plate being secured to said top side wall, said bottom side wall, said first side wall and said second side wall in such a manner that said plate forms a wall for said front side and thereby closes said open front side of said housing;

a layer of insulating material secured inside said housing such that said layer of insulating material covers all sides of said housing except said front side;

a solar absorber plate shorter in length than the length of said housing, said solar absorber plate being secured inside said housing in such a position that said solar absorber plate is spaced apart from said plate and from said layer of insulating material covering said top side wall of said housing and is spaced apart from said layer of insulating material covering said bottom side wall of said housing;

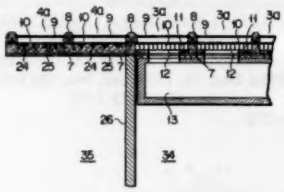
an air flow separator plate shorter in length than the length of said housing, said air flow separator plate being secured inside said housing in such a position that said air flow separator is spaced apart from said solar absorber plate and from said layer of insulating material covering said back side wall of said housing and is spaced apart from said layer of insulating material covering said top side wall of said housing and is spaced apart from said layer of insulating material covering said bottom side wall of said housing; and

a single heat exchanger secured inside said housing adjacent to said layer of insulating material covering said top side of said housing and adjacent to said layer of insulating material covering said back side of said housing.

4,135,491
DWELLINGS EQUIPPED WITH A ROOM-HEATING DEVICE AND HOT WATER FEEDER BASED ON SOLAR HEAT

Hisao Koizumi; Zushi; Yoshinosuke Kawada, Yokohama, and Sadao Fujimura, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki and Toshiba House Living Industry Co., Ltd., Tokyo, both of, Japan

Filed Dec. 23, 1976, Ser. No. 753,824
Claims priority, application Japan, Dec. 26, 1975, 50-158584
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **7 Claims**

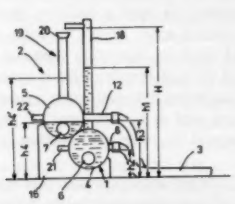


1. A dwelling designed for room heating and supply of hot water based on solar heat, which comprises a dwelling body; roofing covering the dwelling body; a hot air type room-heating device including a plurality of hot air type solar heat collectors; a hot water feeding device including a plurality of hot water type solar heat collectors, and in which the roofing has a plane inclining downward from the ridge to the eaves, said inclining plane being divided into a first section lying directly above the dwelling and two second sections continuous to said first section and extending outward from the dwelling body; wherein said first section comprises a hot air type solar heat-collecting device formed of a plurality of narrow solar heat collectors extending from the ridge to the eaves of the roofing; and each of said two second sections comprises a hot water type solar heat-collecting device similarly formed of a plurality of narrow solar heat collectors extending from the ridge to the eaves separately provided and parallel to said solar heat-collectors of said hot air type solar heat-collecting device and including a boundary disposed between said two second sections and said first section, said boundary being coincident with said dwelling body so that no portion of the hot water type solar heat-collecting device is located above said dwelling body, thereby reducing the danger of water damage to the dwelling.

4,135,492
MANIFOLD ARRANGEMENT

Herbert Heitland, Wolfsburg; Edgard Grundmann, Fallersleben, and Rudolf Kroll, Vorsfelde, all of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 740,032
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550018; Dec. 17, 1975, 2556747
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **17 Claims**



1. In an inlet and outlet manifold arrangement for use with a conduit system of a solar radiation collection, the combination which comprises:

(a) means forming a generally horizontally oriented inlet manifold and a generally horizontally oriented outlet manifold, said inlet manifold comprising, as the main component, a horizontally arranged first tubular body provided with two first closing means for closing off the ends of said tubular body, said outlet manifold comprising, as the main component, a horizontally arranged second tubular body provided with two second closing means for closing off the ends of said second tubular body, said inlet and outlet manifolds being combined into a single entity;

(b) support means for said inlet and outlet manifolds;

(c) inlet means communicating with said inlet manifold and outlet means communicating with said outlet manifold, said inlet means passing through one of said first closing means and said outlet means passing through one of said second closing means;

(d) first connecting means for connecting said inlet manifold to the conduit system, said first connecting means being arranged above said conduit system and the latter being connected directly to said first connecting means, said first connecting means being arranged on the circumference of said first tubular body;

(e) second connecting means for connecting said outlet manifold to said conduit system, said second connecting means being arranged on the circumference of said second tubular body;

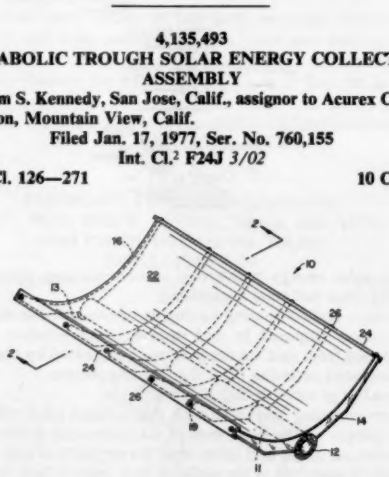
(f) a first riser tube communicating with said first tubular body and having a height such that when the pressure in the conduit system exceeds a predetermined value, said first riser tube serves as an overflow for allowing liquid to escape from said first tubular body and therefore as a means for insuring that a given maximum pressure in said conduit system is not exceeded; and

(g) means, constituted by a second riser tube, forming a second riser communicating with said second tubular body and having a height such as to permit pressure increases of short duration for overcoming increased flow resistance caused by air pockets that may be present in said outlet means.

4,135,493
PARABOLIC TROUGH SOLAR ENERGY COLLECTOR ASSEMBLY

William S. Kennedy, San Jose, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Jan. 17, 1977, Ser. No. 760,155
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **10 Claims**



1. A solar energy collector comprising a collector assembly including a central elongated rib support, a plurality of spaced parallel ribs formed of sheet material secured to and extending outwardly in opposite directions from said rib support with the upper edges of said ribs defining an elongated parabolic surface, a thin sheet of reflecting material supported on the upper edge of said spaced ribs to conform to said parabolic surface to form a parabolic reflector for collecting solar energy and

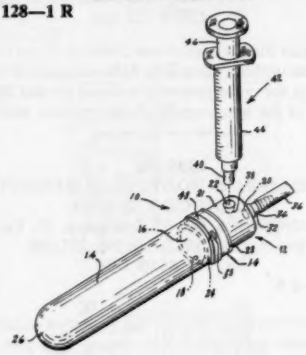
focusing the collected energy along a focal line, and retainer means cooperating between the ends of said ribs and adjacent edges of said sheet to hold the sheet in engagement with said ribs; support means for engaging said elongated rib support to support the collector assembly; and, means disposed at the focal line of said parabolic reflector to receive energy collected and reflected by said parabolic reflector.

4,135,494

OVER-PRESSURE PROTECTION DEVICE

David L. Stoner, College Station; Charles F. Shield, III, San Antonio; Ronald G. Julian, San Antonio, and Ewald Koegel, San Antonio, all of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 9, 1977, Ser. No. 776,038
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 R **2 Claims**



1. An over-pressure protection device for use in the pressure testing of veins comprising a housing, said housing having a hollow interior configuration, a first port of predetermined diameter located in said housing, said first port being coincidental to the longitudinal axis of said housing and operably connected to said hollow interior thereof, a tapered male fitting connected to said housing and in operative alignment with said first port, said tapered male fitting being capable of operative connection to an end of said vein, a second port located in said housing, said second port being situated perpendicular to the longitudinal axis of said housing and operably connected to said hollow interior thereof, said second port being capable of operative connection to means for delivering a fluid under pressure to said hollow interior of said housing, a third port having a diameter greater than said predetermined diameter located in said housing, said third port being coincidental with the longitudinal axis of said housing and operably connected to said hollow interior thereof and a pressure regulating means defined by an elongated resilient membrane removably connected to said housing and in operative relationship with said third port for regulating the pressure of said fluid emanating from said second port, said resilient membrane being capable of extending in a direction coincidental to the longitudinal axis of said housing whereby the pressure of said fluid emanating from said second port and being applied to said vein is limited by the characteristics of said elongated resilient membrane.

4,135,495

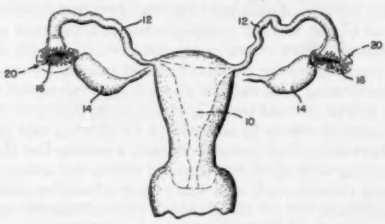
METHOD AND MEANS FOR REVERSIBLE STERILIZATION

Jennings O. Borgen, 1100 University, Apt. 3J, Seattle, Wash. 98101

Filed May 21, 1975, Ser. No. 579,484
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 R **5 Claims**

1. A device for removably capping the fimbriated end of the Fallopian tubes of the human female to provide reverse sterilization without interference with perastolsis of the Fallopian tubes comprising:

an integral one-piece cap of light, thin walled flexible medical grade elastomeric material having (1) an enlarged body portion of a size sufficient to surround and enclose the fimbriated end of a Fallopian tube and (2) an opening in the body portion approximately the diameter of the Fallopian tube,



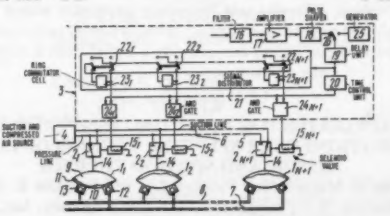
an integral suturing section secured around the opening in the cap conforming essentially to the diameter of the Fallopian tube and extending parallel thereto providing a suturing area for suturing the device to the serosa around the outer circumference of the Fallopian tube so that the body portion of the cap encloses the fimbriated end of the Fallopian tube and provides an impervious barrier to the passage of sperm and ova without interfering with the perastolsis action of the inner ciliated cells of the Fallopian tubes.

4,135,496

EXTRACORPOREAL CIRCULATION APPARATUS

Evgeny I. Chazov; Mikhail Y. Ruda; Vitaly A. Burynin, and Moisei A. Lokshin, all of Moscow, U.S.S.R., assignors to Institut Kardiologii Imeni A.L. Myasnikova Akademii Meditsinskikh Nauk SSSR, U.S.S.R.

Filed Jan. 30, 1976, Ser. No. 653,714
Int. Cl.[2] A61M *1/03*
U.S. Cl. 128—1 D **3 Claims**



1. In an extracorporeal circulation apparatus, a plurality of pumps each having a working chamber for receiving and discharging a fluid such as blood and a second, pump-operating chamber adapted to communicate with a source of operating fluid which operates each pump, each pump including a pumping member separating said chambers of each pump from each other and creating suction in said working chamber while increasing the volume thereof and reducing the volume of said second, pump-operating chamber, while discharging from said working chamber a fluid, such as blood, under pressure when decreasing the volume of said working chamber while increasing the volume of said second-pump operating chamber, each of said pumps including a pair of one-way valves both of which communicate with said working chamber of each pump and one of which is an inlet valve for permitting fluid to flow only into said working chamber of each pump while the other is an

outlet valve for permitting fluid to flow only out of said working chamber of each pump, a feed line communicating with all of said inlet valves for supplying a fluid such as blood to the working chambers of said pumps when said pumping members thereof move along suction strokes increasing the volume of the working chambers of the pumps while decreasing the volumes of the second, pump-operating chambers thereof, and a discharge line communicating with all of said outlet valves for receiving fluid under pressure from said working chambers when said pumping members execute pressure strokes decreasing the volume of said working chambers and increasing the volume of said second, pump-operating chambers, a plurality of solenoid valves respectively communicating with said second, pump-operating chambers of said pumps, a pressure line communicating with each of said solenoid valves and providing a source of fluid under pressure to be delivered through said solenoid valves to said pumps for driving said pumping members along their pressure strokes, a suction line also communicating with all of said solenoid valves and when communicating therethrough with said pumps advancing said pumping members thereof along suction strokes thereof, said solenoid valves respectively having rest positions communicating with said suction line and operating positions communicating with said pressure line, so that when said solenoid valves are in their rest, non-operating positions, the several pumps are respectively connected therethrough to said suction line to maintain said pumping members at the ends of their suction strokes thus maintaining said working chambers filled with fluid from said feed line to be pumped under pressure out of said working chambers when the pumping members are driven along their pressure strokes, means operatively connected with said solenoid valves for operating them sequentially to place said second, pump-operating chambers of said pumps in a given sequence one after the other, but not simultaneously, in communication with said pressure line, so that while any one pump has its pumping member moving along its pressure stroke the other pumps have in their working chambers a supply of fluid to be pumped out of said working chambers according to said given sequence, whereby a considerable amount of time is available for the suction strokes of said pumping members, an electrocardiograph signal means and an adjustable frequency generator means, and switch means for selectively connecting either said electrocardiograph signal means or said frequency generator means to said means for sequentially operating said solenoid valves, whereby said frequency generator means can be used in the case of total cardiac arrest whereas said electrocardiograph signal means can provide a signal from a patient.

4,135,497

APPARATUS FOR DETECTING TEMPERATURE VARIATIONS OVER SELECTED REGIONS OF LIVING TISSUE, AND METHOD THEREOF

Phillip H. Meyers, New Orleans, La., and Franklin R. Greene, Flushing, N.Y., assignors to E-Z-EM Company, Inc., Westbury, N.Y.

Filed Mar. 18, 1977, Ser. No. 779,264
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 H **16 Claims**

1. A method of detecting temperature variations over selected regions of the breasts of a woman within a predetermined range of temperatures, and which method utilizes liquid crystals enclosed between elastic flexible sheets which represent a composite film, and which crystals are responsive to changes in skin temperatures of said breasts to display a color pattern on said film representative of said temperature variations, said method comprising:

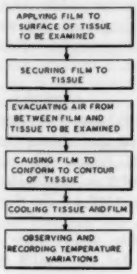
(a) wrapping said film around the breasts to be examined,

(b) securing said film in position around said breasts;

(c) positioning a first end of a tubular member and a spacer adjacent said first end in a region spaced from the edges of said film and between said breasts, said spacer providing communication between said first end of said tubular member and the region under said film;

(d) connecting the opposite end of said tubular member to a vacuum source;

(e) evacuating air from between said film and said breasts;


APPLYING FILM TO SURFACE OF TISSUE TO BE EXAMINED
SECURING FILM TO TISSUE
EVACUATING AIR FROM BETWEEN FILM AND TISSUE TO BE EXAMINED
CAUSING FILM TO CONFORM TO CONTOUR OF TISSUE
COOLING TISSUE AND FILM
OBSERVING AND RECORDING TEMPERATURE VARIATIONS

(f) causing said film to stretch and conform to the contour of said breasts without materially deforming said breasts; and

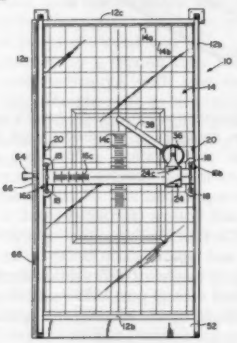
(g) observing the color pattern produced on said film representative of the temperature variations over said breasts.

4,135,498

DEVICE FOR MAKING BODY MEASUREMENTS OF A PATIENT OR THE LIKE

George L. McGee, Rte. 4, Box 55, Lewisburg, W. Va. 24901

Filed Apr. 13, 1977, Ser. No. 787,008
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—2 S **7 Claims**



5. A device for making measurements with respect to the body of a patient or the like, said device comprising:

a frame construction behind which the patient stands whose body measurements are to be determined, said frame construction comprising a frame and a non-opaque sheet-form viewing screen mounted by said frame and providing viewing of at least the silhouette of a patient standing behind said screen;

a vertically extending measuring means centrally disposed on said viewing screen and graduated along the length thereof in measuring units;

a horizontally extending, vertically movable measuring bar graduated in measuring units along the length thereof;

means for mounting said measuring bar on said frame for relative movement with respect to said vertically extending measuring means; and

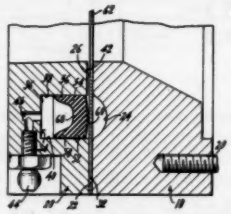
an angle measuring means mounted on said measuring bar for movement along the length thereof, said angle measuring means including a pivotably mounted measuring member and means for indicating the angular position of said pivotably mounted measuring member, said pivotably mounted measuring member being graduated in measuring units along the length thereof, said device further

comprising an x-ray light box, and pivotable mounting means connected to said frame for pivotably mounting said x-ray light box to permit movement of said light box between an operative position away from said screen and an operative position behind said screen for viewing through said screen.

4,135,499
SEALING PISTON

Frederick A. Schumacher, Wykoff, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Continuation of Ser. No. 734,179, Oct. 20, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,305
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—15 **5 Claims**



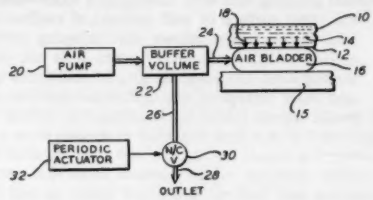
1. In a blade mounting and tensioning apparatus, said apparatus including first and second confronting annular clamping members, means disposed proximate the circumference of each of said clamping members for fixedly clamping the periphery of a circular blade therebetween, an annular fluid channel within said first clamping member located radially inward of said blade clamping means and having an opening confronting one side of said blade, means for communicating pressurized fluid to said fluid channel, an annular recess channel within said second clamping member radially aligned with said annular fluid channel and having an opening confronting the other side of said blade, the opening of said recess channel being formed to receive an overlying portion of said blade when said overlying blade portion is deformed in response to pressure transmitted to said one side of said blade by said pressurized fluid to thereby tension said blade, the improvement comprising:

a unitary annular sealing piston formed of deformable resilient material arranged to be disposed in said fluid channel for axial sliding movement therein to deform said blade in response to said pressurized fluid within said fluid channel, said fluid channel having a pair of substantially smooth side walls for sliding engagement with said piston; said piston having a main body part with a blade contact surface on one side thereof confronting said one side of said blade, said contact surface being operative to maintain substantially uniform contacting relationship with respect to said one side of said blade when said piston slides in said fluid channel to deform said blade, the other side of said main body part having a pair of sealing arms extending therefrom, each of said sealing arms being urged radially outwardly in sealing relationship against each of said side walls, respectively, for sealing said pressurized fluid within said fluid channel; said main body part having a cross section with a ratio of thickness to radial extent thereof sufficient to maintain each of said sealing arms in said sealing relationship when said piston deforms said blade in response to said pressurized fluid confronting said other side of said main body portion.

4,135,500
APPARATUS FOR OSCILLATING FLOTATION SUPPORT SYSTEMS

Jody A. Gorran, East Windsor, N.J., assignor to Medpro, Inc., East Brunswick, N.J.

Filed Apr. 28, 1977, Ser. No. 791,960
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **7 Claims**



1. In combination with a flotation support system, apparatus for introducing periodic pressure displacements to said system to effect oscillations thereof; said apparatus comprising:

an expandable and contractable gas bladder underlying said system and mechanically coupled therewith, whereby expansions and contractions of said bladder are coupled to said system;

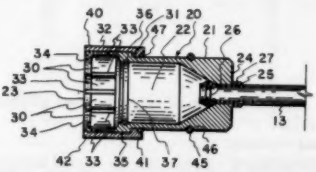
a relatively constant gas pressure source connected for pressurizing said bladder to expand same;

a buffer volume connected in series with and between said gas pressure source and said bladder; said gas pressure source and said bladder being in permanent open communication with said buffer volume; a normally closed valve means connected to said buffer volume; and means for periodically actuating said valve means to open same and thereby effect periodic venting of said buffer volume, and thereby said bladder to atmosphere; whereby said gas bladder contracts in response to the forces coupled thereto from said overlying system and thereupon expands following termination of said venting; the coupling of the resultant expansions and contractions of said bladder to said system, effecting said oscillations thereof.

4,135,501
DENTAL MASSAGE DEVICE

Henry P. Leunissan, 1811 Woodland Ave., Palo Alto, Calif. 94303

Filed May 4, 1977, Ser. No. 793,749
Int. Cl.[2] A61H *9/00*
U.S. Cl. 128—66 **5 Claims**



1. A dental massage device for coupling the cylindrical outflow end of a faucet to an elongated water ejector comprising:

(a) an adaptor means including

a generally cylindrical main body member provided with an axially formed chamber opening on a first end thereof and an axial bore extending from a second end thereof to open on said chamber, the peripheral surface of said main body member being provided with a plurality of longitudinally formed slots extending from said first end at least partially to said second end to thereby

define a plurality of flexible gripping portions at said second end, each of said gripping portions being provided with a radially inwardly extending tooth means at its terminal end, and

sleeve means disposed over said main body member and slidable along the outer peripheral surface thereof, said sleeve means being operative to squeeze said gripping members radially inwardly when it is positioned around said gripping members, causing said tooth means to grip the outer surface of said cylindrical outflow end and said sleeve means allows said gripping members to expand radially outwardly when it is not positioned therearound, releasing the grip of said tooth means on said outer surface of said cylindrical outflow end;

(b) handle means including an elongated hollow member provided with a first axial bore extending from a first end towards a second end thereof and a second axial bore of a smaller diameter which extends from said second end towards said first end and which opens on said first axial bore, where an expanded portion of said water ejector can telescope into said first axial bore at said first end; and

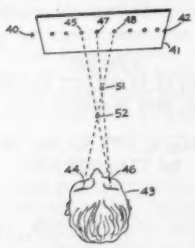
(c) flexible hose means including a tube having an external diameter less than said smaller diameter, the tube having a first end portion attached within the axial bore of said main body and having a second end portion disposed through said second bore and into said first bore, said flexible hose means further including a ferrule means inserted into said tube proximate said second end, said ferrule means having an outside diameter sufficient to expand the portion of the outer peripheral surface of said flexible hose which surrounds said ferrule to a diameter greater than said second diameter, thereby preventing the withdrawl of said tube from said handle means.

4,135,502

STEREOSCOPIC PATTERNS AND METHOD OF MAKING SAME

Donald Peck, 23219 Lake Rd., Bay Village, Ohio 44140

Filed Sep. 7, 1976, Ser. No. 720,572
Int. Cl.[2] A61H 5/00
U.S. Cl. 128—76.5 **19 Claims**



1. A pattern capable of being viewed to produce a stereoscopic effect, which comprises:

a blank backing, and

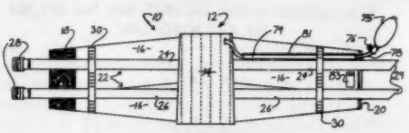
a multiplicity of representations on said backing spaced apart in substantially horizontal rows, each of the representations in each horizontal row being substantially identical, an adjacent pair of said representations when viewed stereoscopically producing a first stereoscopic image and two ghost images, another of said representations located on said backing in a position in which the image produced by stereoscopically viewing said other representation combines with one of said ghost images produced by one of said adjacent pair of representations to produce second stereoscopic image, the remainder of said multiplicity of representations located on said backing in positions in which the images produced by each of said representations combine with ghost images produced by other representations to produce additional stereoscopic images, the spacing between various pairs of adjacent representations in each horizontal row being varied to produce a plurality of horizontally spaced stereoscopic images perceived in various planes from said pairs of adjacent representations, said backing being devoid of any marking other than said representations to avoid producing distracting images.

4,135,503

ORTHOPEDIC DEVICE

Nicholas A. Romano, 30 Pasadena Ave., North, St. Petersburg, Fla. 33710

Filed Jan. 5, 1977, Ser. No. 757,073
Int. Cl.[2] A61F 5/02
U.S. Cl. 128—78 **12 Claims**



1. An orthopedic device of the type primarily designed to provide ambulatory traction to specific levels of the spine, said device comprising: belt means configured for attachment in substantially surrounding relation to a patient's body, said belt means including connecting means mounted adjacent opposite ends thereof, whereby said belt means may be removably attached to the patient; traction means secured to said belt means and disposed in pressure bearing relation to predetermined portions of the spine of the patient, support means secured to said belt means and supportingly engaging said traction means; said traction means comprising a base, an expandable bladder mounted on said base and disposed to extend outwardly therefrom in a predetermined direction, a template plate secured to said base on the opposite side of the bladder relative to said base, said template plate comprising aperture means formed therein and being specifically configured and dimensioned to define the primary direction of extension of said bladder therethrough, said bladder being secured in substantially sandwiched relation between said base and said template plate, each of said base and said template plate comprising substantially rigid material plate elements, said aperture means including at leat one aperture specifically dimensioned and configured to direct protrusion of said bladder therethrough in a predetermined direction and into a predetermined portion of the patient situated adjacent said orthopedic device, whereby force is exerted on predetermined portions of the body of the patient dependent upon the primary direction of the extension of said bladder through said template plate.

4,135,504

ORTHOPEDIC SUPPORT

Donald C. Spann, 5 Ferncreek Ct., Greenville, S.C. 29607

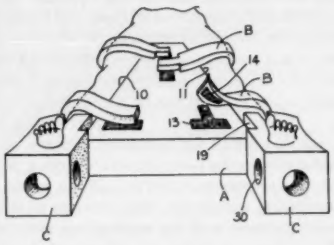
Filed Mar. 24, 1977, Ser. No. 780,761
Int. Cl.[2] A61F 3/00
U.S. Cl. 128—80 A **6 Claims**

1. An abduction pillow for immobilizing the lower limbs of orthopedic patients comprising:

a flat wedge shaped body constructed of uncovered synthetic foam material tapering outwardly at opposite sides;

spaced strapping constructed of flat strips of synthetic foam material extending about spaced portions of each limb fixing same against respective sides of said body maintaining said limbs in divergent fixed positions corresponding to the divergent disposition of said sides; and

a block constructed of synthetic foam material having a internal cavity therein carried adjacent a lower corner of



said wedge shaped body for receiving and supporting the foot and ankle portions of said limbs.

4,135,505

ORTHOPAEDIC FRACTURE FIXING APPARATUS

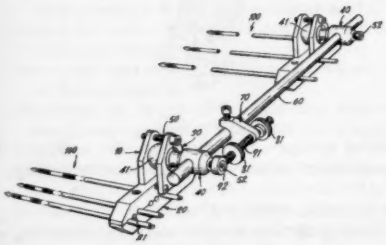
William H. Day, London, England, assignor to National Research Development Corporation, London, England

Filed Apr. 14, 1977, Ser. No. 787,475

Claims priority, application United Kingdom, Apr. 30, 1976, 17727/76

Int. Cl.[2] A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 A **6 Claims**



5. Orthopaedic fracture fixing apparatus for use in association with two sets of bone pins respectively located on opposite sides of a fracture, said apparatus comprising:

an elongate member;

two universal joint assemblies respectively connected with opposite end portions of said elongate member and to couple said elongate member with respective ones of said bone pin sets;

and an adjustment assembly connected between one of said universal joint assemblies and said elongate member to adjust the mutual spacing of said universal joint assemblies along said elongate member;

said adjustment assembly including:

a bolt with a head of apertured form in freely encompassed coupling with one of said universal joint assemblies;

a plate apertured and receiving said bolt in sliding engagement and having a slot along its edge and said plate receiving said elongate member in such slot and receiving a screw to clamp said elongate member in said slot;

and two nuts engaged with said bolt on opposite sides of said plate to adjust and secure the position thereof along said bolt.

4,135,506

METHOD OF AND DEVICE FOR PINNING A FRACTURED VERTEBRA

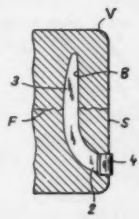
Max B. Ulrich, Amselstr. 55, Ulm, Germany (7900)

Filed Mar. 15, 1977, Ser. No. 777,725

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1976, 2610907

Int. Cl.[2] A61F *5/04*; A61B *17/18, 17/28*

U.S. Cl. 128—92 B **12 Claims**



1. A bone pin having a pair of coplanar ends substantially at right angles to one another, a bend between said ends said ends and said bend lying substantially in a common plane, and at least one laterally extending lug at one of said ends securable to a vertebra in which said pin is set, said lug lying, generally perpendicular to said plane and the other of said ends being pointed for setting the pin in said vertebra.

4,135,507

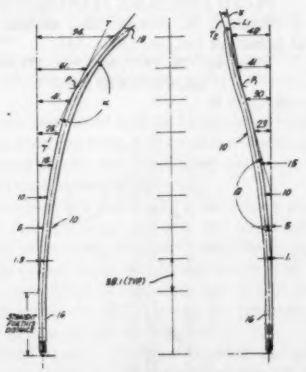
CONDYLOCEPHALIC NAIL FOR FIXATION OF PERTROCHANTERIC FRACTURES

Leslie J. Harris, 340 The Village, #112, Redondo Beach, Calif. 90277

Filed May 20, 1977, Ser. No. 798,811

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—92 BC **13 Claims**



1. An elongated unitary member, made of flexibly resilient material, for condylocephalic insertion and implantion within the intramedullary canal of the femur, said member having:

(a) in the anterior-posterior view a radius of curvature that is non-uniform and having further an included angle in a first proximal end portion of said member subtended by

(i) a tangent line to said member, taken at a point P in said first proximal end portion of said member, and by

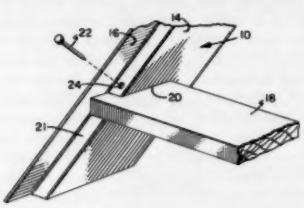
(ii) a line drawn from said point P to the proximal tip of said member

of between about 162°–172° and

(b) in the medial-lateral view an S-shaped curve comprising a minor anteversion arcuate curvature extending over a second proximal end portion of said member and a major

anterior-posterior arcuate curvature extending over the remaining portion of said member.

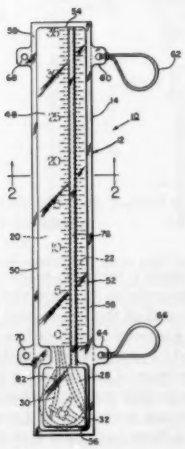
4,135,508
STAIRWAY STRINGERS
Robert J. Lyons, 1060 Ridge Rd., Hamden, Conn. 06514
Filed Nov. 3, 1977, Ser. No. 848,206
Int. Cl.[2] E06C *7/08, 7/50, 9/02*
U.S. Cl. 182—194 **4 Claims**



1. In a stairway stringer comprising an elongate metal member for disposition on an incline having a plurality of slots therein, each of which extends transversely of said stringer in a horizontal direction when said stringer is disposed in its inclined position, each slot being closed at one end and open at one edge of said stringer to receive a wood tread member and having upper and lower edges spaced from each other at the open end of the slot by a dimension at least equal to the thickness of said tread member, the improvement wherein

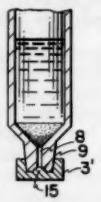
said upper and lower edges of said slot are inclined toward each other over at least a portion of their length so that the vertical dimension of the slot at its closed end is less than the thickness of said tread member whereby said tread member is wedged deformed between the edges of said slot as it is driven to the closed end thereof.

4,135,509
FLUID PRESSURE MANOMETER
Thomas J. Shannon, St. Joseph, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Apr. 26, 1977, Ser. No. 791,105
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 D **22 Claims**



1. A packaged liquid manometer for measuring fluid pressure wherein the manometer package constitutes an integral structural portion of the manometer, comprising an elongate body member defining a first package portion, cover means connected to said body member to define a closed chamber therebetween, said cover means defining a second package portion, means defining a manometer lumen extending longitudinally within said chamber and having opposed upper and lower ends within said chamber, said upper end being open to said chamber for the flow of air between the chamber and the upper portion of said lumen, said body member being transparent in at least portions thereof adjacent said lumen so that when liquid is in said lumen its level can be seen through said body member, and scale means including indicia extending longitudinally adjacent said lumen for indicating pressure, at least a portion of said cover means being separable from a portion of said body member to permit access to said lower end of said lumen for connecting said lumen with a source of liquid and connecting said chamber with the atmosphere, whereby said lower end of said lumen is contained within said chamber and is inaccessible prior to use but accessible for connection to said source of liquid after said portion of said cover means is separated from said portion of said body member.

4,135,510
SYRINGE BARREL
Pierre Assouly, Puteaux, France, assignor to Schering Corporation, Kenilworth, N.J.
Filed Apr. 20, 1977, Ser. No. 789,040
Claims priority, application France, Feb. 9, 1977, 77 03638
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 R **10 Claims**



1. A prefilled syringe which minimizes the settling of a suspended medicament within the syringe bore comprising:

a barrel;

a plunger extending within said barrel;

a needle holding tip with a bore, said bore comprising a capillary portion having a 0.3 to 0.7 mm diameter and a flared distal portion with a diameter greater than said capillary portion;

a medicament suspension within said syringe;

and a tip shield with an integral protrusion which extends into said flared distal end.

4,135,511
METHOD FOR START UP OF A YARN CRIMPING PROCESS
Ronnie D. Nikkel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation of Ser. No. 692,713, Jun. 4, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,177
Int. Cl.[2] D02G *1/12, 1/16, 1/20*
U.S. Cl. 28—221 **16 Claims**

1. A method for the start-up of a yarn crimping process comprising:

passing a yarn to a yarn crimping zone suitable for heating the yarn and producing a yarn plug therefrom;

passing a fluid to a first fluid heating zone capable of heating the fluid to a first and a second temperature, wherein said second temperature is the yarn crimping temperature and said first temperature is the yarn string-up temperature,

said second temperature being higher than said first temperature,

passing said heated fluid to said yarn crimping zone;

monitoring the yarn to determine whether a yarn plug is being produced in said yarn crimping zone;

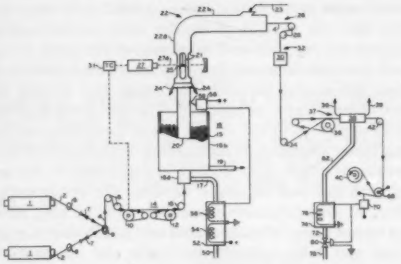
heating the fluid to said second temperature if the yarn plug is being produced; and

heating the fluid to said first temperature if the yarn plug is not being produced.

11. A method for controlling the temperature of heating fluids used in a yarn crimping process comprising:

passing a yarn to a yarn crimping zone suitable for heating the yarn and producing a yarn plug therefrom;

passing a fluid to a first fluid heating zone capable of heating the fluid to a first and a second temperature, wherein said second temperature is the yarn crimping temperature and



said first temperature is the yarn string-up temperature and said second temperature is higher than said first temperature;

passing said heated fluid to said yarn crimping zone;

monitoring the yarn to determine whether a yarn plug is being produced in said yarn crimping zone;

heating the fluid to said second temperature if the yarn plug is being produced;

heating the fluid to said first temperature if the yarn plug is not being produced;

monitoring the length of the yarn plug with respect to a predetermined position when said yarn plug is being produced;

increasing the crimping temperature of the yarn when said yarn plug is at or above said predetermined position, and;

decreasing the crimping temperature of the yarn when said yarn plug is below said predetermined position.

4,135,512

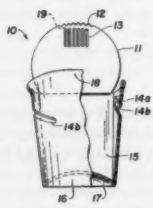
MEDICATION DISPENSING CUP

David W. Godsey, 437 Poppy Pl., Mountain View, Calif. 94043

Filed Apr. 15, 1977, Ser. No. 787,865

Int. Cl.[2] A61J *7/00*

U.S. Cl. 128—222 **9 Claims**



1. A cup for simultaneously dispensing medication along with a liquid, the cup comprising a bottom, a sidewall, the bottom and the sidewall being integrally joined together to constitute a fluid holding container which is open at its top, and a lid to cover the open top of the container, the lid having at least one aperture therein which is smaller than the size of the medication to permit the passage of fluid from the container therethrough while preventing the medication from passing into the container, and a dry, medication support surface adjacent to the aperture and exterior to the container, hinge means for attaching the lid to the open top of the container at an angle which is downward when the cup is positioned vertically upright so that the medication rests against the cup's sidewall as well as upon the surface of the lid, and means for locking the lid in a position which closes the container top which is diametrically opposite to the sidewall flat portion being tilted downwardly when the cup is positioned vertically upright.

4,135,513

DRINKING NOZZLE FOR BOTTLES AND SIMILAR CONTAINERS

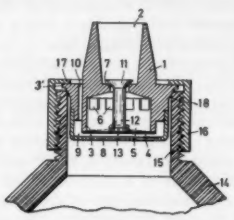
Kjell O. Arisland, St. Catharines, Canada, assignor to A/S Alto, Oslo, Norway

Filed Sep. 22, 1976, Ser. No. 725,623

Claims priority, application Norway, Sep. 26, 1975, 753274

Int. Cl.[2] A61J *11/04*

U.S. Cl. 128—252 **4 Claims**



1. Drinking nozzle apparatus for bottles or similar containers, comprising:

an inner, hollow, substantially cylindrical member adapted to be introduced in a tightenable manner into a container opening;

an outer nozzle connected with said cylindrical member and adapted to protrude from said container opening;

a valve located in the communicating path between said cylindrical member and said nozzle;

said valve comprising a valve seat, a valve body and a shaft extending through said valve seat and connected at one end to said valve body, said valve body being positioned on the side of said valve seat facing said nozzle;

a membrane connected to the other end of said shaft, said membrane being connected along its periphery to the inner end of said cylindrical member;

a cover secured to said cylindrical member and projecting below the inner end of said cylindrical member to define a space between said membrane and said cover;

a bore extending axially through said cylindrical member and providing communication between said space and the atmosphere;

said cylindrical member also containing openings positioned to connect the inside of said container with the space within the hollow interior of said cylindrical member;

said cylindrical member having a peripheral seal portion extending radially outward of said openings and adapted to be in sealed engagement with the free edge of said container opening;

said nozzle extending axially outward on one side of said seal portion, and said bore communicating with atmosphere on said one side of said seal portion.

4,135,514

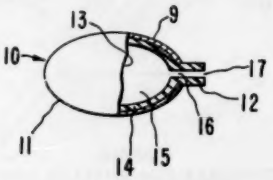
OSMOTIC RELEASING SYSTEM FOR ADMINISTERING OPHTHALMIC DRUG TO EYE OF ANIMAL

Alejandro Zaffaroni; Alan S. Michaels, both of Atherton, and Felix Theeuwes, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 536,006, Dec. 23, 1974, Pat. No. 4,036,227, which is a continuation-in-part of Ser. No. 354,344, Apr. 25, 1973, abandoned. This application Mar. 9, 1977, Ser. No. 775,989

Int. Cl.[2] A61M *31/00*

U.S. Cl. 128—260 **10 Claims**



1. An ocular osmotic device sized and adapted for the administration of a beneficial drug, said ocular device comprising:

(a) a shaped wall formed of a semipermeable non-toxic material that maintains its integrity during the administering period, is permeable to the passage of eye fluid and substantially impermeable to the passage of drug, said wall surrounding and forming;

(b) a compartment containing drug;

(c) a layer of a non-toxic, inert bioerodible material on the exterior surface of the semipermeable wall;

(d) a passageway in the wall, said passageway communicating with the compartment and the exterior of the device for administering drug from the device; and,

(f) wherein, when the device is in the environment of use, the layer bioerodes at a controlled rate to regulate the amount of eye fluid available to the wall, which eye fluid is imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously dissolving drug which is administered through the passageway from the device at a controlled rate over a prolonged period of time.

4,135,515

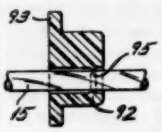
MEDICAL/SURGICAL SUCTION EQUIPMENT

Edward E. Muriot, Horsham, Pa., assignor to Health Technology Laboratories, Inc., Colmar, Pa.

Continuation-in-part of Ser. No. 637,140, Dec. 3, 1975, Pat. No. 4,004,590, and a continuation-in-part of Ser. No. 614,226, Sep. 17, 1975, Pat. No. 3,982,539, said Ser. No. 637,140, is a continuation-in-part of said Ser. No. 614,226, and a continuation-in-part of Ser. No. 524,052, Nov. 15, 1974, Pat No. 3,963,027, which is a continuation-in-part of Ser. No. 497,838, Aug. 16, 1974, abandoned, said Ser. No. 614,226, is a continuation of said Ser. No. 497,838. This application Sep. 9, 1976, Ser. No. 721,779

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—276 **9 Claims**



1. For use in combination with medical/surgical suction equipment having a vacuum chamber with a vacuum connection and further with an opening with a notched wall at an edge of the opening and with a displaceable closure member for said opening having a surface overlapping the wall notch and cooperating to define a closed but openable vacuum compartment: a disposable suction bag for body liquids adapted to be received in the vacuum compartment and having an opening for communicating with the interior of the compartment, a disposable suction tube connected and in communication with the bag through a portion of the bag wall, the tube being adapted to extend from the bag through said notch to a point outside of the compartment, and disposable sealing means mounted on the tube and configured and positioned for engagement with said wall notch, the sealing means having portions of larger and smaller cross section in spaced planes transverse to the axis of the tube and further having a sealing surface for engagement with the surface of the displaceable closure member adjacent to the wall notch, the portion of the sealing means of larger cross section being located more remote from the bag than the portion of smaller cross section and being configured and proportioned in relation to the notch to engage the wall structure adjacent the notch under the influence of the pressure differential between the inside and outside of the vacuum compartment, at least one of (a) said portion of the bag and (b) the portion of the tube between the sealing means and the bag being yieldable to accomodate movement of the sealing means to effect tight sealing engagement of the sealing means with the wall structure adjacent the notch under the influence of said pressure differential, and the bag, tube and sealing means being interconnected and handleable as a disposable unit and being unitarily insertable and removable with respect to the vacuum compartment when the closure member is open.

4,135,516

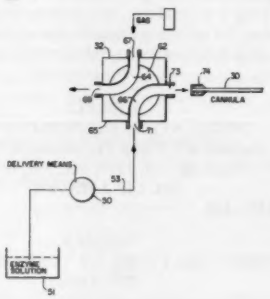
DELIVERY APPARATUS AND METHOD FOR TREATMENT OF INTRALENTICULAR CATARACTS WITH EXOGENOUS ENZYMES

Joseph Spina, Bryn Mawr, Pa., and Michael K. Weibel, Redding, Conn., assignors to Novo Laboratories, Incorporated, Wilton, Conn.

Continuation-in-part of Ser. No. 660,873. This application Feb. 24, 1977, Ser. No. 771,572

Int. Cl.[2] A61F *9/00*

U.S. Cl. 128—303 R **9 Claims**



1. An apparatus for introducing a predetermined dosage unit volume of enzyme solution into cataracts comprising:

(a) a reservoir of enzyme solution and an enzyme solution delivering means therefrom

(b) a source of gas

(c) a multiport valve having therein at least four ports

(d) a cannula

said cannula, gas source and reservoir being each connected to a different valve port, the fourth valve port being an exhaust port, said valve having therein two channels connectable to said ports two by two with the gas source connecting to the exhaust port and the reservoir connecting to the cannula; and

conversely, the gas source connecting to the cannula and the reservoir connecting to the exhaust port,

the combined volume within said cannula and the valve port connected to the cannula being predetermined to correspond to a single dosage unit of enzyme solution, and the volume of each valve channel being greater than a single dosage unit,

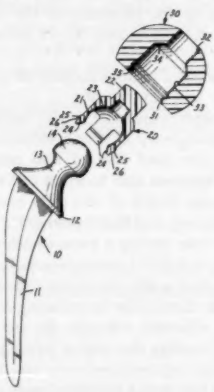
whereby enzyme solution may be delivered from said reservoir through one channel of said valve into the cannula, while gas passes from the gas source through the second channel of said valve to the exhaust port of said valve, then upon complete valve reversal interposing the gas containing second channel in line between enzyme reservoir and cannula, all gas trapped in said second channel by the valve reversal becomes a gaseous separator limiting continuous enzyme solution flow out the cannula to the single dosage unit volume already downstream of the gas trapped, and the source of gas for a gas bubble capable of sealing off the track made by cannula penetration into a cataract.

4,135,517

FEMORAL PROSTHESIS TRIAL FITTING DEVICE

Richard C. Reale, Park Ridge, N.J., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 21, 1977, Ser. No. 817,551
Int. Cl.[2] A61B *17/00*; A61F *1/24*
U.S. Cl. 128—303 R **7 Claims**



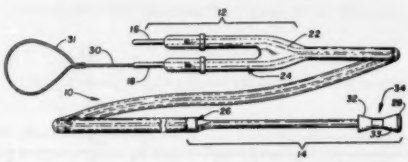
1. A trial fitting device for an implantable femoral prosthesis comprising a trial head, a bearing insert removably fitting within said trial head and a femoral prosthesis stem or a trial handle having a ball on one end thereof onto which said bearing insert is removably rotatably mounted, said trial head comprising a substantially spherical body having a flat surface portion formed by removing a segment of a sphere therefrom thereby simulating the natural human femoral head and having a central bore extending axially through the flat surface portion, said bore having an annular groove formed therein adjacent the flat surface portion of said body, said bearing insert comprising a substantially cylindrical body having a plurality of flexible arms depending from one end thereof and a rigid cylindrical protrusion forming the other end, said flexible arms each having an annular ring segment on the exterior surface thereof adjacent its free end for locking action with the annular groove of said bore, said cylindrical body and the inner surfaces of said flexible arms being formed into a spherical cavity into which the ball of the femoral prosthesis stem is mounted, said spherical cavity comprising a larger segment of a sphere than the ball of said femoral prosthesis stem such that the free ends of said flexible arms extend past the spherical surface of said ball of said femoral prosthesis stem such that the free ends of said flexible arms can deflect inwardly to release the annular ring segments from the annular groove when pressure is applied on the rigid cylindrical protrusion of the bearing insert to thereby allow the bearing insert and attached femoral prosthesis stem to be removed from the trial head for replacement with a differently sized trial head.

4,135,518

BODY IMPLANTABLE LEAD AND ELECTRODE

Robert G. Dutcher, Columbia Heights, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed May 21, 1976, Ser. No. 688,807
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 **12 Claims**



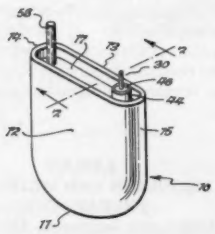
1. In a body implantable lead of the type including a proximal end adapted for connection to an electrical device and a distal end adapted to contact living tissue and a conductor extending between the proximal and distal ends, the improvement comprising a first segment of said conductor having a first flexibility and an axial mechanical loading characteristic and a second segment of said conductor having a second flexibility greater than said first flexibility and incapable of sustaining said axial mechanical loading characteristic.

4,135,519

CARDIAC PACER HAVING ALKALI METAL-HALOGEN CELL WITH MIXED HALOGEN CATHODE

Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031

Filed Nov. 21, 1977, Ser. No. 853,136
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PS **6 Claims**



1. A cardiac pacer comprising:

(a) pulse forming means having an input and an output;

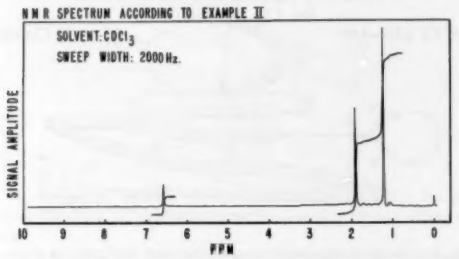
(b) a pair of electrodes connected to the output of said pulse forming means, at least one of which is adapted to be operatively coupled to a patient's heart; and

(c) a voltage source connected to the input of said pulse forming means and comprising a battery having an alkali metal anode, a solid alkali metal-halogen electrolyte and a cathode comprising a mixture of two halogens, one of said halogens providing a discharge of said battery at a first level of battery output voltage and the other of said halogens providing discharge of said battery at a second level of battery output voltage.

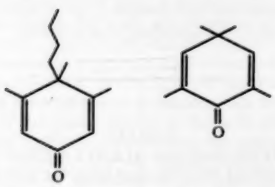
4,135,520
TOBACCO FLAVORING WITH CYCLOHEXADIENE DERIVATIVES

Kenneth K. Light, Long Branch; Bette M. Spencer, Ocean Grove; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Manfred H. Vock, Locust, N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 774,058, Mar. 3, 1977, Pat. No. 4,076,854.
This application Dec. 13, 1977, Ser. No. 860,122
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R **2 Claims**



1. A smoking tobacco composition comprising (i) smoking tobacco and (ii) intimately admixed therewith a tobacco flavor composition comprising a cyclohexadiene derivative selected from the group consisting of:



and a tobacco flavor adjuvant selected from the group consisting of betamethylcinnamaldehyde; eugenol; dipentene; damascenone; maltol; ethyl maltol; benzaldehyde; amyl acetate; ethyl butyrate; ethyl valerate; ethyl acetate, 2-hexenol-1; 2-methyl-5-isopropyl-1,3-nonadiene-8-one; 2-methyl-5-isopropyl acetophenone; 2-hydroxy-2,5,5,8a-tetramethyl-1-(2-hydroxyethyl)decahydronaphthalene; dodecahydro-3a,6,6,9a-tetramethyl naphtho-(2,1b)-furan; 4-hydroxy hexanoic acid gamma lactone; polyisoprenoid hydrocarbons; celery seed oil, coffee extract; bergamot oil; cocoa extract; nutmeg oil and origanum oil.

4,135,521
TOBACCO PRODUCTS AND METHODS FOR THEIR PREPARATION

Johannes D. Malan, and Jacobus C. Thirion, both of Stellenbosch, South Africa, assignors to Tobacco Research & Development Institute Limited, Zug, Switzerland

Filed Mar. 11, 1977, Ser. No. 776,885
Claims priority, application South Africa, Jun. 17, 1976, 763603
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—141 **8 Claims**

1. A method of upgrading a first batch of tobacco comprising

the steps of forming a second batch of tobacco into an aqueous slurry,

adding a suitable soluble carbohydrate to the slurry,

innoculating the slurry with an alcohol-producing yeast,

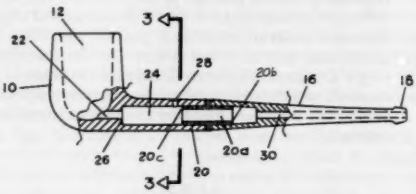
allowing fermentation to go to completion; and

utilizing material from the resultant liquid medium to upgrade the first batch of tobacco.

4,135,522
VENTILATED SMOKING PIPE

David E. Hendricks, Rte. 5, Box 243, Pickens, S.C.

Filed Jun. 15, 1977, Ser. No. 806,681
Int. Cl.[2] A24F *5/04*
U.S. Cl. 131—198 R **4 Claims**



1. A smoking pipe comprising:

a bowl having a cavity for receiving and burning tobacco therein;

a stem integral with said bowl;

a removable mouthpiece open for the passage of air and smoke having a tip for reception in the mouth and an insert portion remote from said tip for insertion into said stem;

a passageway adjacent a bottom portion of said bowl communicating with said bowl cavity;

a longitudinal ventilation chamber in said stem communicating with said passageway having a substantially uniform cross-section larger than that of said passageway and extending from adjacent said bowl on one end along substantially the entire length of said stem and on the other end thereof receiving said insert portion;

an air ventilation hole having a cross-sectional area in the range of 0.00145 to 0.00181 of a square inch formed in said stem communicating with said ventilation chamber intermediate the ends thereof for introducing outside air into said ventilation chamber wherein the smoke and air is evenly blended cooling the smoke passing through said chamber; and

said air ventilation hole being located closely adjacent a free edge of said insert portion when received within said stem approximately 0.625 of an inch from a junction of said passageway and ventilation chamber affording substantially unrestricted introduction of air into said ventilation chamber.

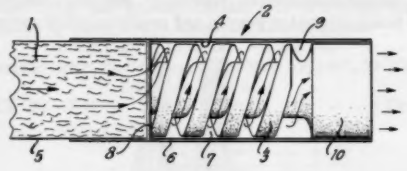
4,135,523
TOBACCO-SMOKE FILTERS

John A. Luke, Romsey, and Fred Haslam, Southampton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Mar. 11, 1977, Ser. No. 776,774
Claims priority, application United Kingdom, Mar. 17, 1976, 10766/76
Int. Cl.[2] A24B *15/02*
U.S. Cl. 131—261 B **7 Claims**

1. A smoking-article filter element comprising a body of fibrous filter material offering a filter surface which has at least one helical groove in its peripheral surface and is closely wrapped in a material pervious to vapor-phase constituents of the smoke, whereby vapor-phase constituents are removed by diffusion thereof through said wrapping material during passage of the smoke along the said helical groove, while particu-

late-phase constituents are removed mechanically from the smoke passage through the said body at least a portion thereof



removed by passage of smoke through the part of the body other than the groove.

4,135,524

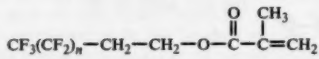
PROCESS FOR REDUCING CRITICAL SURFACE TENSION AND COEFFICIENT OF FRICTION IN HAIR

Ira E. Rosenberg, West Norwalk; John A. Ferguson, Darien, and Norman P. Loveless, Fairfield, all of Conn., assignors to Clairol Incorporated, New York, N.Y.

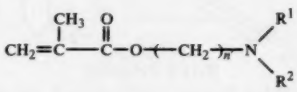
Filed Mar. 30, 1977, Ser. No. 782,679
Int. Cl.[2] A45D *7/00; A61K 7/00, 7/06, 7/09*
U.S. Cl. 132—7 **18 Claims**

1. A process for treating human hair to reduce its critical surface tension and its coefficient of friction which comprises treating said hair with an effective amount of a composition comprising a carrier selected from the group consisting of liquids, creams, gels, foams, and aerosol propellant systems and about 0.005% to about 30% by weight of a fluoropolymer comprising:

(a) from about 60% to about 90% by weight of units derived from a monomeric fluoroalkylmethacrylate of the formula:

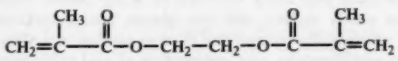


(b) from about 5% to 25% by weight of units derived from a monomeric aminoalkylmethacrylate of the formula:



its N-oxides or its salts; and

(c) from about 0 to 10% by weight of units derived from a monomeric ethylenedimethacrylate of the formula:



wherein:

(d) n is a number of about 7 to 11 inclusive;

(e) n′ is a number of about 2 to 4 inclusive; and

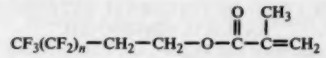
(f) R^1 and R^2 are lower alkyl having 1 to 4 carbons and wherein:

(g) the sum of percentages of said monomers contained in said fluoropolymers is 100%.

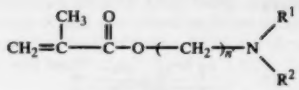
7. A process according to claim **1** in which said hair is dried after said treatment by blow drying it with drying means adapted to deliver a stream of hot air.

13. As a human hair treating composition of matter in combination an aqueous carrier, surfactant and about 0.005% to about 30% by weight of a fluoropolymer comprising:

(a) from about 60% to about 90% by weight of units derived from a monomeric fluoroalkylmethacrylate of the formula:

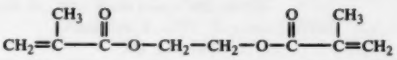


(b) from about 5% to 25% by weight of units derived from a monomeric aminoalkylmethacrylate of the formula:



its N-oxides or its salts; and

(c) from about 0 to 10% by weight of units derived from a monomeric ethylenedimethacrylate of the formula:



wherein:

(d) n is a number of about 7 to 11 inclusive;

(e) n′ is a number of about 2 to 4 inclusive; and

(f) R^1 and R^2 are lower alkyl having 1 to 4 carbons and wherein:

(g) the sum of percentages of said monomers contained in said fluoropolymer is 100%;

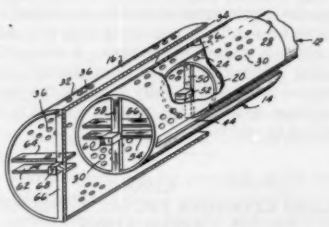
said fluoropolymer being present in sufficient amount to reduce the critical surface tension and coefficient of friction of hair treated with said composition.

4,135,525

MULTIPLE HAIR ROLLERS

Igor Kriger, 6812 N. Lakewood, Apt. 3C, Chicago, Ill. 60626

Filed Oct. 31, 1977, Ser. No. 847,229
Int. Cl.[2] A45D *2/02*
U.S. Cl. 132—39 **13 Claims**



1. Hair dressing apparatus comprising

a plurality of hollow rollers of different diameter for telescopic association and disposition,

each of said rollers including an open first end, a second end with openings therein and a wall with openings therethrough,

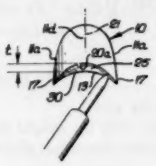
each of said rollers which has at least one other roller therein including a slot extending from said first end toward said second end to receive a tress of hair therethrough after a portion of the tress has been rolled upon the adjacent inner roller, and

complementary shaped coupling means at said second ends for coupling said rollers for mutual rotation and holding the same against relative rotation, said coupling means forming an open web across said second ends to permit the passage of air therethrough.

4,135,526
APPLICATION OF FINGERNAL EXTENSION TO NATURAL FINGERNAIL

Eve Matranga, West Los Angeles, and Yosh Hokama, Torrance, both of Calif., assignors to International Beauty Distributor, Gardena, Calif.

Filed Sep. 9, 1977, Ser. No. 831,806
Int. Cl.[2] A45D *29/00*
U.S. Cl. 132—73 **1 Claim**



1. An artificial fingernail attachable to a natural fingernail having a forward generally convex edge, said artificial fingernail comprising

(a) a thin plastic sheet element sized to provide a forward extension of the natural fingernail, said element extending generally horizontally,

(b) said element having a rearwardly concave crescent shaped distal edge and forming a recess below said edge to receive and conform generally to the shape of the convex forward edges of the natural fingernail;

(c) there being a rearwardly concave crescent shaped stop at the proximal underside of the artificial fingernail in spaced relation to said rearward distal edge, the stop extending everywhere vertically and located to abut the natural fingernail forward edge to position the artificial fingernail so that an underside portion of the artificial fingernail may overlap and be bonded to an upper surface portion of the natural nail,

(d) the artificial fingernail including two rearwardly projecting cusps toward which extremities of both said crescent shaped, rearward distal edge and said crescent shaped stop extend in generally rearwardly directions, the curvature of said crescent shaped rearward distal edge being lesser than the curvature of said crescent shaped stop, the stop spaced forwardly of said distal edge at a distance which becomes a maximum proximate a forwardly extending medial axis defined by the sheet element, said maximum distance being substantially less than the forward dimension from either cusp to a plane normal to said axis and tangent to said stop.

4,135,527
EYELASH EXTENDER PRODUCT AND METHOD OF APPLICATION

Alexandra Montiel, 50 Jefferson St., Brooklyn, N.Y. 11206

Filed Jan. 21, 1977, Ser. No. 761,339
Int. Cl.[2] A45D *40/26*
U.S. Cl. 132—88.7 **11 Claims**

1. A product for extending the length of and enhancing the appearance of natural eyelashes, which comprises:

a liquid mascara adhesive;

first container means for holding said liquid mascara adhesive;

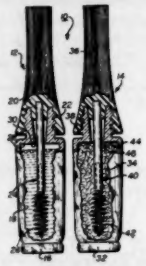
first applicator means for applying said liquid mascara adhesive to the natural eyelashes;

loose synthetic fiber filaments;

second container means for holding said loose synthetic fiber filaments;

second applicator means for applying said synthetic fiber filaments to the natural eyelashes moistened by first applying said liquid mascara adhesive to the eyelashes by said first applicator means;

said fiber filaments, when applied by outwardly directed strokes of said second applicator means along the length of the moistened natural eyelashes, being held on the natural eyelashes by said liquid mascara adhesive and being oriented in parallel and overlying relationship with

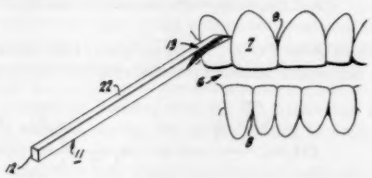


the natural eyelashes, so that each resultant composite lash thus created is of uniform apearance throughout its length, is independently spaced from its adjacent composite lashes and extends outwardly to a length substantially greater than the length of the natural eyelash.

4,135,528
INTERDENTAL STIMULATOR

Marvin M. Stark, Los Altos Hills, Calif., assignor to Marvin M. Stark Research Foundation, Santa Clara, Calif.

Filed Mar. 31, 1977, Ser. No. 783,184
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—89 **3 Claims**

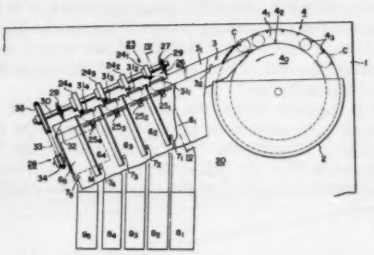


1. An interdental stimulator comprising a straight stick of clear wood elongated in the direction of the wood grain and for the most part being bounded by a top planar surface, a bottom planar surface, and two planar, lateral surfaces and being substantially rectangular in cross-section in a plane normal to said direction, one end portion of said stick being defined between said top planar surface and only two side surfaces, there being near the end of said stick a portion defined by said two mutually inclined, longitudinal, approximately planar but partly concave side surfaces, said side surfaces intersecting in a longitudinally extending bottom ridge inclined with respect to said direction and said side surfaces merging smoothly with said lateral surfaces, said end portion being substantially triangular in cross-section in a plane normal to said direction and being no greater in cross-sectional area than the cross-sectional area of said rectangular portion, said end portion also being truncated to form a planar surface inclined with respect to said direction, merging with said top planar surface and located opposite the bottom ridge apex of said triangular portion, and said end portion being of a size to be at least partly received in the normal interproximal spaces between human teeth.

4,135,529
COIN CLASSIFICATION DEVICE IN COIN PROCESSING MACHINE

Katuhiko Onoe, and Takashi Tanaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Mar. 9, 1978, Ser. No. 885,042
Claims priority, application Japan, Mar. 12, 1977, 52-27499
Int. Cl.[2] G07D 3/12
U.S. Cl. 133—3 C 5 Claims

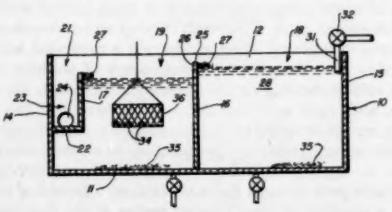


1. In a coin classifying device in a coin processing machine, having a coin pick-up device provided in a coin receiving section for picking up coins of various denominations one after another, and a coin feeding passageway extending obliquely downwardly from the coin receiving section and comprising a coin rolling track and a coin supporting plate; the improvement comprising a plurality of rollers provided above the coin feeding passageway to be rotated in a given direction, the plurality of rollers being positioned such that the peripheral parts of the rollers are moved substantially perpendicularly to the coin feeding passageway and disposed to separate coins of respective denominations having respective diameters, and means for driving the plurality of rollers in said direction, whereby each of said rollers separates coins of respective diameter corresponding to the height from the coin rolling track to the lowest peripheral part of that roller out of the coin rolling track into a respectively separate collecting member, and the rollers being disposed to classify the coins in sequence from those of the greatest diameter to those of the smallest diameter.

4,135,530
RINSING TANK

Bruce R. Cheney, Vernon, Conn., assignor to Litton Industrial Products, Inc., East Hartford, Conn.

Filed Sep. 15, 1975, Ser. No. 613,572
Int. Cl.[2] B08B 3/04
U.S. Cl. 134—60 4 Claims



1. A rinsing tank comprising at least one rinse section and an outlet section,

a weir separating said sections having an upper edge,

means for introducing a positive continuous flow of rinse fluid into said rinsing tank on the side of said rinse section farthest upstream from said weir,

said weir having a plurality of flow control passages spaced along and extending from said upper edge to permit smooth passage of rinse fluid below the level of the upper edge of said weir, and

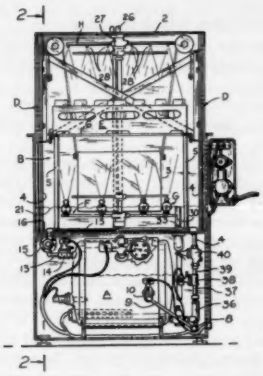
means to establish a rate of flow to maintain rinse fluid movement at a level below the upper edge of said weir, whereby floating scum continuously moves toward and is accumulated and held back by said weir with the major portion of the surface area of said rinse section free of scum,

said accumulated floating scum being movable over the upper edge of said weir when parts are immersed in said rinse section and raise the rinse fluid level above the upper edge of said weir.

4,135,531
DISHWASHER OPERATED SOLELY BY STEAM AND HOT WATER PRESSURE

George J. Federighi, and George B. Federighi, both of 70 Thirteenth St., San Francisco, Calif. 94105

Filed Sep. 6, 1977, Ser. No. 830,920
Int. Cl.[2] B08B 3/02
U.S. Cl. 134—95 7 Claims



7. In a dishwasher:

(a) a wash/rinse compartment for receiving and supporting a dish-carrying basket;

(b) a tank underlying said compartment and adapted to receive water therefrom, the tank holding a predetermined volume of water;

(c) a boiler containing a volume of water with heating means therein for heating the water and generating steam within said boiler;

(d) a first hollow wash arm for spraying water onto the dishes in said compartment;

(e) a first means associated with said arm and boiler for conveying steam from said boiler and mixing it with a supply of water from the tank water for causing said hollow wash arm to direct steam and water against the dishes during the washing cycle;

(f) a first hollow rinse arm mounted for spraying rinse water onto the dishes;

(g) a second means associated with said rinse arm and said boiler for conveying hot water from said boiler to said rinse arm for rinsing the dishes during the rinse cycle;

(h) means for feeding fresh water into said boiler;

(i) means for feeding fresh water into said rinse arm;

(j) a temperature controlled mixing valve for controlling the flow of fresh water from the fresh water supply to the rinse arm and mixing it with the hot water from the boiler for maintaining the same temperature for the rinse water; and

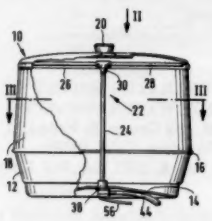
(k) timing means for first activating said first means for washing the dishes for a predetermined time period and

subsequently activating said second means for rinsing the dishes for a predetermined time period.

4,135,532
DISHWASHER

Ernest Rutherford, 10, Edinburgh Dr., Bishops Court, Cape Town, South Africa

Filed Apr. 11, 1977, Ser. No. 786,666
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—100 **3 Claims**

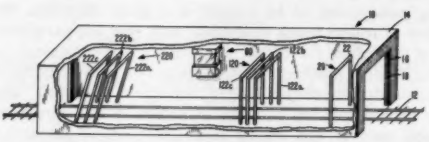


1. A dishwasher which includes
(a) a container having a floor and an open top;
(b) a lid adapted to be placed on the container top for closing it off;
(c) water inlet means into the container;
(d) water outlet means for draining water from the container;
(e) a rotatable spray means mounted rotatably in the container, the rotatable spray means including a tubular T-shaped spray member including a substantially vertical tubular stem, and a first tubular arm and a second tubular arm, both of which tubular arms are substantially horizontal and are joined to the vertical stem at the top thereof, the ends of the tubular arms being closed off;
(f) a bearing support means at the bottom of the vertical stem to support it rotatably on the floor of the container,
(g) a fluid guide joining the water inlet means to the vertical stem for supplying water into the vertical stem and from the vertical stem into the first and second tubular arms;
(h) article support means for supporting articles to be washed substantially below the first and second tubular arms;
(i) a number of spaced holes in the vertical stem and in the first and second tubular arms for providing jets of water for rotating the tubular spray member and for washing and rinsing articles supported by the article support means inside the container, the spaced holes in the tubular T-shaped spray member being arranged to include:
(i1) a number of spaced holes in the vertical stem, each hole adapted to provide a water jet substantially at 90° to the longitudinal axis of the vertical stem and in a plane passing vertically through the longitudinal axis of the stem;
(i2) a number of spaced holes in the vertical stem, each hole adapted to provide a water jet directed at between 70° and 80° to the longitudinal axis of the vertical stem and in a plane passing vertically through the longitudinal axis of the stem and on the same side of the longitudinal axis as the 90° holes;
(i3) a number of spaced holes in the vertical stem, each hole adapted to provide a water jet directed at between 55° - 65° to the longitudinal axis of the vertical stem and in a plane passing vertically through the longitudinal axis of the stem but on the opposite side of the longitudinal axis as the 90° and 70° - 80° holes;
(i4) a number of spaced holes in the first horizontal arm, each hole adapted to provide a water jet in a plane passing substantially vertically through the longitudinal axis of the arm and being directed between 60° and 90° to the horizontal downwardly;
(i5) at least one hole in the first horizontal arm, the or each hole adapted to provide a water jet in a plane passing through the longitudinal axis of the arm at between 3° - 10° below the horizontal, the jet being directed at substantially 90° to the longitudinal axis of the arm;
(i6) a number of spaced holes in the second horizontal arm, each hole adapted to provide a water jet in a plane passing substantially vertically through the longitudinal axis of the second arm and being directed at between 55° - 65° to the horizontal downwardly;
(i7) a number of spaced holes in the second horizontal arm, each hole adapted to provide a water jet in a plane passing at substantially 55° - 65° below the horizontal through the longitudinal axis of the second arm and being directed at between 55° - 65° to the horizontal downwardly; and
(i8) at least one hole in the second horizontal arm, the or each hole adapted to provide a water jet in a plane passing through the longitudinal axis of the arm at between 3° - 10° below the horizontal and being directed at substantially 90° to the longitudinal axis of the arm.

4,135,533
VEHICLE CLEANING SYSTEM

Herbert J. Gall, Camp Springs, and Robert T. Noonan, Temple Hills, both of Md., assignors to National Railroad Passenger Corporation, Washington, D.C.

Filed Mar. 16, 1978, Ser. No. 887,276
Int. Cl.[2] B60S *3/04*; B08B *3/02*
U.S. Cl. 134—104 **3 Claims**



1. A high-pressure brushless system for cleaning large vehicles on a vehicle path as the vehicles pass through a pre-wet station, a wash station and a rinse station, with the wash station and the rinse station capable of directing sprays of washing liquid and rinsing liquid onto vehicles of specific outer configurations at a specific impact angle and a specific impact pressure to achieve optimum cleaning of vehicles of various outer configurations, said system comprising a source of pre-wetting liquid; a pre-wet conduit arch at the pre-wet station and connected to the source of pre-wetting liquid and having an arrangement of nozzles designed to direct sprays of pre-wetting liquid onto a vehicle moving on the vehicle path through the pre-wet station to adjust the vehicle body temperature; a source of washing liquid; a plurality of wash conduit arches at the wash station, each of the wash conduit arches connected to the source of washing liquid and having a particular arrangement of nozzles designed to direct sprays of washing liquid onto a vehicle moving on the vehicle path through the wash station, with each arch and the nozzles thereof of the wash conduit arches designed to provide a specific impact angle and a specific impact pressure of washing liquid on the surface of a vehicle having a specific outer configuration and moving on the vehicle path through the wash station; a source of rinsing liquid; a plurality of rinse conduit arches at the rinse station, each of the rinse conduit arches connected to the source of rinsing liquid and having a particular arrangement of nozzles designed to direct sprays of rinsing liquid onto a vehicle moving on the vehicle path through the rinse station, with each arch and the nozzles thereof of the rinse conduit arches designed to provide a specific impact angle and a specific impact pressure of rinsing liquid on the surface of a vehicle having a specific outer configuration and moving on the vehicle path through the rinse station; and control means for selectively

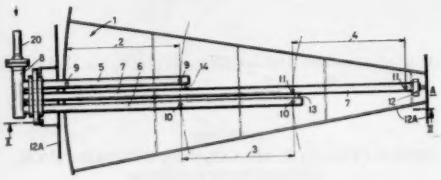
activating a mated set of one wash arch, for spraying washing liquid therefrom, and one rinse arch, for spraying rinsing liquid therefrom.

4,135,534

MULTI-NOZZLE MULTIPLE LANCE FOR WASHING ROTATING HEAT EXCHANGERS AND A DISTRIBUTOR FOR SAID LANCE

Giulio Autelli, via Giordano Bruno 18/9, Genoa, Italy

Filed Aug. 1, 1977, Ser. No. 820,687
Claims priority, application Italy, Dec. 23, 1976, 12947 A/76
Int. Cl.[2] B08B *3/02, 9/00*
U.S. Cl. 134—170 **5 Claims**



1. A lance system for cleaning a rotary drum heat exchanger, comprising;

a plurality of hollow lances disposed side by side;

means for stationarily mounting the lances so that they extend radially over an end of a rotary heat exchanger drum consisting of sheet packs coaxial with the drum's axis of rotation;

a set of nozzles on each lance, axially spaced from the sets of nozzles on the other lances, for discharging a washing fluid into a corresponding one of the sheet packs;

a cylindrical supply manifold common to and communicating with the lances at axially spaced apart points of the manifold, the manifold being disposed outside the drum;

a cylindrical distributor rotatably mounted in the manifold for cyclically supplying the washing fluid to the lances; and

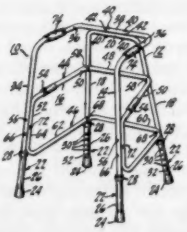
means for rotating the distributor for the cyclic supplying of the washing fluid.

4,135,535

INVALID WALKER APPARATUS

Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Filed Oct. 4, 1977, Ser. No. 839,223
Int. Cl.[2] F16M *13/08;* **A61H** *3/00*
U.S. Cl. 135—67 **6 Claims**



1. An improved Invalid Walker Apparatus comprising:

a pair of front legs including a first and a second front leg respectively;

a pair of rear legs including a first and a second rear leg respectively;

a pair of first connecting means for connecting said first rear leg to said first front leg and said second rear leg to said second front leg respectively;

a first pair of grip means each attached to one of said first connecting means respectively;

a first intermediate section for connecting said first pair of connecting means together in a continuous fashion;

a second pair of connecting means for connecting said first rear leg to said first front leg and said second rear leg to said second front leg respectively, said second pair of connecting means being located below said first pair of connecting means;

a second pair of grip means each attached to one of said second pair of connecting means respectively;

a second intermediate section for continuously connecting said second pair of connecting means together, said second pair of connecting means and said second intermediate section forming a substantially U-shaped member, said U-shaped member formed by said second pair of connecting means and said second intermediate section comprising a piece of hollow metal tubing, the ends of which are bent downwardly and attached to said first and second rear legs respectively;

a third pair of connecting means for connecting said first rear leg to said first front leg and said second rear leg to said second front leg respectively, said third pair of connecting means being located below said second pair of connecting means;

a third intermediate section for continuously connecting said third pair of connecting means together, said third pair of connecting means and said third intermediate section forming a substantially U-shaped member, said U-shaped member formed by said third pair of connecting means and said third intermediate section comprising a piece of hollow metal tubing, the ends of which are bent upwardly and attached to said first and second rear legs respectively;

and,

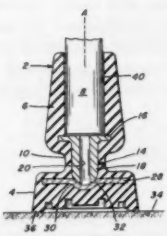
a fourth intermediate section for connecting said first and second front legs together in a continuous U-shaped fashion.

4,135,536

TIP MEMBERS FOR CRUTCHES AND THE LIKE

Wilburn C. Willis, Rte. 2, Hagerstown, Ind. 47346

Filed Aug. 18, 1977, Ser. No. 825,681
Int. Cl.[2] A45B *9/04*
U.S. Cl. 135—84 **18 Claims**



1. A crutch tip including

a unitary resilient tip member having a gripper pad, a crutch holder and an interposed sleeve portion,

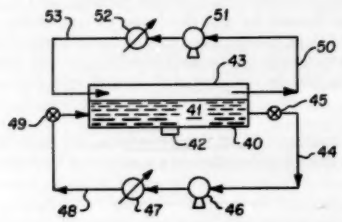
a pivot pin having a disc-like upper portion disposed within said crutch holder and a depending pin portion extending through said sleeve portion and into said gripper pad,

an instep plate having an upwardly concave portion and being disposed within said gripper pad,

said depending pin portion having a surface of generally complementary configuration with respect to said upwardly concave portion of said instep plate and being in contact with said concave portion, whereby relative movement between said pivot pin and said instep plate is permitted,

said upwardly concave portion of said instep plate having an upwardly exposed, generally spherical surface,
said depending pin portion surface having a generally spherical configuration,
said instep plate having a diameter greater than the maximum diameter of said crutch holder,
said crutch holder and said pivot pin disc-like portion cooperating to define a generally cylindrical recess for receipt of said crutch,
said disc-like portion having a diameter greater than the diameter of said holder recess, and
said instep plate having a diameter greater than the diameter of said disc-like portion.

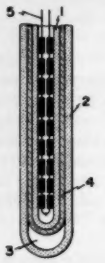
4,135,537
LIGHT COLLECTOR
Harry R. Blieden, Los Angeles, Calif., and Roderick W. MacDonald, Richardson, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Filed Mar. 20, 1978, Ser. No. 888,093
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 PC **13 Claims**



1. A light collector comprising a hollow collector chamber adapted to transmit light from outside said chamber into its hollow interior, inlet conduit means for passing luminescent fluid into the hollow interior of said chamber, outlet conduit means for removing luminescent fluid from the hollow interior of said chamber, heat exchange means for removing heat from the luminescent fluid in said outlet conduit means, photovoltaic means carried by said chamber for generating electricity, and said chamber carries in heat exchange relationship therewith a separate hollow cooling channel adapted to have a separate cooling fluid passed therethrough to cool said chamber.

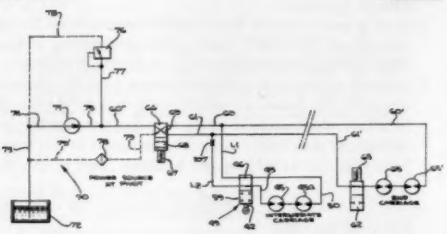
4,135,538
THERMOCOUPLE PROTECTING TUBE
Sumihiko Kurita, Arita, Japan, assignor to Koransha Co., Ltd., Saga, Japan
Filed Sep. 7, 1977, Ser. No. 831,313
Claims priority, application Japan, Nov. 30, 1976, 51-160660[U]
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—234 **12 Claims**

1. A thermocouple protecting tube for continuously measuring the temperature of molten steel comprising:
(a) an inner ceramic tube having one end closed, and containing a thermocouple element therein,
(b) an outer silica glass tube disposed concentrically over said inner ceramic tube and over said one closed end of said inner tube forming an annular space therebetween, and



(c) an intermediate heat-insulating layer within said annular space.

4,135,539
SPEED CONTROL MEANS FOR CENTER PIVOT IRRIGATION SYSTEM
Edwin J. Hunter, Rancho Santa Fe; Richard E. Hunter, Carlsbad, and Richard W. Cudworth, San Marcos, all of Calif., assignors to The Toro Company, San Marcos, Calif.
Continuation of Ser. No. 746,856. This application Mar. 27, 1978, Ser. No. 890,033
Int. Cl.[2] B05B *3/12*
U.S. Cl. 137—1 **5 Claims**



1. In a center pivot irrigation system revolving about a center pivot having a plurality of articulated span units each including a drive carriage adjacent one end having a hydraulically driven motor for operating associated carriage wheels at a speed directly proportional to the rate of hydraulic fluid passing therethrough wherein the motors are connected in parallel between a supply line and a return line of a pressurized hydraulic fluid source, the improved method of operation with low pressures and low volumes of circulating hydraulic fluid comprising the steps of:
(a) operating the hydraulic fluid source to circulate only a preselected constant volume of hydraulic fluid per unit time through the supply and return line such as will produce a preselected net lineal distance travelled of all the drive carriages about the center pivot; and,
(b) controlling the distribution of said constant volume of fluid being circulated to the individual motors of all span units except the one furthest from the center pivot by means of individual valve means connected to individually control the flow of hydraulic fluid to each motor as a function of angular deviations between adjacent span units such that the supply of fluid to the motor of any such controlled span unit which is ahead of or even with a position of preselected alignment with the adjacent span units is reduced in any ever increasing amount as such unit gets further ahead, the supply of fluid to the motor of any span unit which is lagging behind such position is increased in an ever increasing amount as the amount of lag

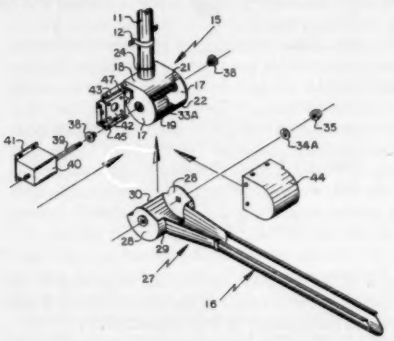
increases, and all fluid not used in the other span units is used to drive the motor of the span unit furthest from the center pivot whereby a preselected net travel of the system about the center pivot per unit time is maintained.

4,135,540

MANUAL OR AUTOMATIC DRAINAGE DEVICE FOR DOWNSPOUTS

Karl H. Felsen, 47 Mattinee Bay, Winnipeg, Canada (R2G 1X9)

Filed Mar. 4, 1977, Ser. No. 774,236
Claims priority, application Canada, Mar. 23, 1976, 248877
Int. Cl.[2] F16L *27/00*
U.S. Cl. 137—78 **6 Claims**



1. An adaptor and run-off conduit for downspouts secured to a supporting surface of a building which include an open lower end; comprising in combination an enclosure, said enclosure including an upper side, a curved base portion and a pair of spaced and parallel side portions, said enclosure having an inlet and outlet therein situated approximately 90° from one another, said inlet being defined at least in part by an edge of said base portion, said enclosure being secured by the inlet to the lower end of the associated downspout, a discharge conduit component, means to hingedly secure said conduit component at one end thereof to said enclosure whereby said conduit component is movable from a substantially vertical closed position in juxtaposition with said downspout, to a lower, water discharging position at least 90° from the vertical, means to detachably secure said conduit component to the associated downspout when in the said vertical closed position, said one end of said conduit component being operatively connected to said outlet of said enclosure, and means to secure said adaptor to the said supporting surface of the building, said discharge conduit component comprising a pair of spaced and parallel side wall plates located on opposite sides of the side portions of said enclosure and a base portion located between said side plates and shaped to conform to the curvature of said base portion of said enclosure and to register with a part of said base portion of said enclosure when said conduit component is in said closed position thereof.

4,135,541

PRESSURE RELIEF AND LOAD CHECK VALVE ASSEMBLY

Larry W. Lorimor, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 15, 1977, Ser. No. 815,955
Int. Cl.[2] G05D *11/00*; F16K *31/363*
U.S. Cl. 137—116.3 **7 Claims**

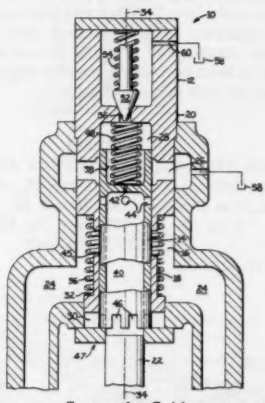
1. A valve assembly comprising:

a housing having an inlet and first and second outlets;

a spool positioned in the housing and movable between a first position at which fluid communication between said inlet and second outlet is blocked and a second position at which said inlet and second outlet are in fluid communication, said spool being movable towards the second position in response to an inlet fluid pressure exceeding a preselected value;

biasing means for urging the spool towards the first position;

a sleeve positioned about the spool and being slidably movable in the housing independently of said spool between a first position at which fluid communication between said first outlet and inlet is blocked and a second position at which said inlet communicates with said first outlet, said sleeve being movable toward the first position substantially in response to a first outlet fluid pressure exceeding the inlet fluid pressure, said sleeve substantially maintaining the fluid pressure in the first outlet while in the first position independently of the position of said spool;



biasing means for urging the sleeve towards the first position; and

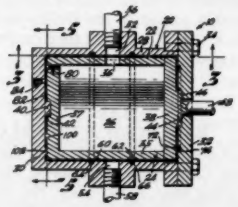
means for exposing said sleeve to the fluid pressure in the inlet for urging said sleeve toward the second position.

4,135,542

DRAIN DEVICE FOR COMPRESSED AIR LINES

James R. Chisholm, 771 Coral Dr., Cape Coral, Fla. 33904

Filed Sep. 12, 1977, Ser. No. 832,591
Int. Cl.[2] B01D *53/04*; F16T *1/45*; F16K *24/04*
U.S. Cl. 137—204 **9 Claims**



1. An automatic drain device in combination with a compressed air conduit in a pneumatic system in a position to remove water, oil, rust particles and other contaminants therefrom comprising,

a cylindrical housing providing a cylindrical wall and first and second end walls defining an inner chamber, an inlet port through said cylindrical wall for connection to the compressed air conduit and an outlet drain port,

a cylindrical rotor axially rotatably journalled within said housing inner chamber providing a cylindrical wall and first and second end walls defining an inner collector chamber, and a single port through said cylindrical wall in a position for sequential alignment with said inlet and outlet ports, said rotor being reduced in size relative to said housing inner chamber to define a slight space between said housing and rotor walls, means to automati-

cally rotate said rotor to sequentially position said single port with said inlet and outlet ports at predetermined time intervals;

valve means comprising a first normally closed spring loaded ball valve extending through said rotor first end wall and a second normally closed spring loaded ball valve extending through said housing first end wall; and

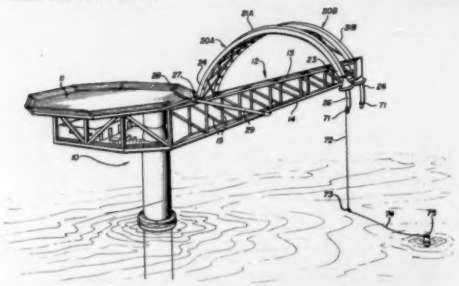
means to open said valve means comprising a first cam segment of a predetermined length extending inwardly from said first housing end wall into said slight space and a second cam segment of a predetermined length extending inwardly from said first end wall, said first and second cam segments being positioned and sized to simultaneously actuate said first and second spring loaded ball valves to open positions when said single port is in general alignment with said outlet port.

4,135,543

HOSE STORAGE AND SUPPLY APPARATUS

Douglas W. DeGraaf, Downers Grove, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 17, 1977, Ser. No. 852,329
Int. Cl.[2] B67D *5/00*
U.S. Cl. 137—236 S **21 Claims**



1. A hose storage and supply apparatus comprising:

a hose guide track having front and rear ends,

the guide track having means on which a hose can move as it is paid out or is retracted,

a trolley adapted to move along the guide track,

a fluid coupling means on the trolley joined to the end of a hose on the guide track and having means for a fluid supply conduit to be connected thereto, and

means operably joined to the trolley to force it along the guide track to pull the hose thereon from a paid out to a retracted position.

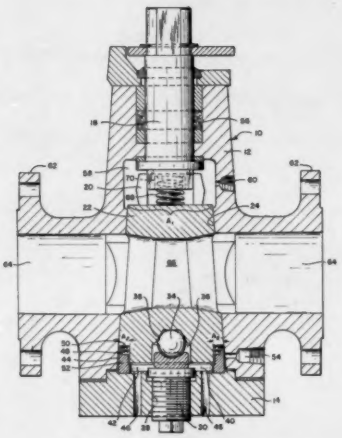
4,135,544

BALANCED PLUG VALVE

John G. MacLeod, Allison Park, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1977, Ser. No. 773,600
Int. Cl.[2] F16K *5/22*
U.S. Cl. 137—246.22 **10 Claims**

1. A tapered plug valve comprising: a casing having a passageway therethrough for the flow of fluid and a tapered bore intersecting said passageway, a tapered plug rotatably mounted in said tapered bore adapted to block said passageway in a valve closed position, said plug having a bore adapted to connect and be in communication with said passageway in a valve open position, said plug and said casing defining an apex chamber at the small end of said tapered plug and a base chamber at the large end of said plug, sealing means provided at the large end of said tapered plug to sealingly divide said base chamber into a first and second cavity, means for introducing a pressurized medium into said apex chamber and said second cavity, said first cavity being vented to atmosphere, the radially extending area of the end of the small end of said tapered plug against which said pressurized medium acts being greater than the radially extending area of the end of said tapered plug in said second cavity against which said pressurized medium acts whereby the resulting force along the longitudinal axis of



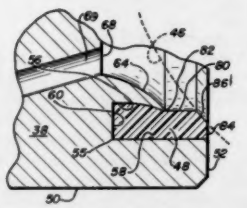
said plug is in the direction toward the large end of said tapered plug when the pressure in the apex chamber is substantially equal to the pressure in said second cavity.

4,135,545

BALL VALVE SEAT ASSEMBLY HAVING A SWAGED SEAT RING TO RETAIN THE FACE SEAL

James M. Fowler, Missouri City, and George A. Moran, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 5, 1977, Ser. No. 822,104
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—246.22 **1 Claim**



1. In a valve having a valve body with inlet and outlet passageways connected by a valve chamber with a valve member mounted in the valve chamber and movable between open and closed positions, and an annular seat pocket around one of said passageways and opening to said valve chamber, an improved valve seat assembly comprising:

(a) a metal seat ring mounted in said seat pocket for movement in a direction longitudinally of the passageways, said seat ring having an annular groove facing said valve member and a deformable inner wall defining the smaller diameter side of said annular groove, said annular groove prior to deformation of said inner wall having generally parallel sides;

(b) said deformable inner wall prior to deformation having a relatively thick root portion, a relatively thin lip portion, and a relatively short tapered inner side connecting said root portion and said lip portion, said deformable inner wall terminating at a relatively sharp point formed at the free end of the thin lip portion;

(c) an annular resilient seal ring having an outer circumference of a uniform diameter mounted in said groove and retained by said deformable wall, said seal ring having a front face inclined relative to said outer circumference to establish line sealing contact with said valve member, an outer end in contact with the bottom of said groove, and an enlarged thickness rear end portion adjacent said outer end fitting within a bottom portion of said groove;

(d) said deformable inner wall having a small diameter portion adjacent said enlarged thickness rear end portion, and a large diameter portion joining said face with said small and large diameter portions connected by a tapered portion located along a mid-portion of said deformable wall;

(e) said deformable wall being permanently deformed outwardly over said seal ring enlarged portion to grip and anchor said seal ring in said groove such that said groove small diameter side contacts and substantially conforms to the shape of said enlarged portion and said tapered portion with said lip portion being impressed slightly into said large diameter portion of said seal ring, the small diameter side of said groove being deformed from its parallel relation to the large diameter groove side into a tapered portion adjacent the bottom of the groove with the thin lip portion defining a contiguous portion remaining in generally parallel relation to the large diameter groove side;

(f) said seat ring having a front O-ring mounted in a groove around the outer perimeter thereof at the end portion thereof housing said seal ring, said seat ring having a reduced diameter portion on the rear end portion opposite said seal ring forming an outer abutment at the juncture with the large diameter portion having said seal ring;

(g) said seat ring having a rear O-ring mounted in a groove around said reduced diameter portion, said seat ring having a lubricant passage therethrough extending from the interior thereof adjacent said seal ring to the outer perimeter thereof between said O-rings, said annular seat pocket having larger and reduced diameter portions joined by a seat pocket abutment extending between the larger and reduced diameter portions; and

(h) spring means in said seat pocket between said seat outer abutment and said seat pocket abutment to bias said seat ring toward said valve member.

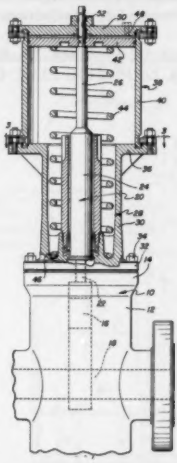
4,135,546

STEM PACKING ASSEMBLY FOR GATE VALVES AND MEANS FOR REMOVAL

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,180
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—315 **8 Claims**

5. In combination with a gate valve and fluid actuator therefor having a gate valve body, a gate valve mounted in said body for reciprocal movement, a stem connected to the gate valve and extending therefrom, a bonnet on the gate valve body including a main bonnet body having upper and lower flanges thereon, a cylindrical actuator housing mounted on the upper bonnet flange and receiving the stem, a piston mounted within the housing and operatively connected to the stem for moving the gate valve between open and closed positions, a removable connecting ring removably connecting the cylindrical housing to the upper bonnet flange, a packing sleeve about the valve stem and removably secured to the lower portion of the bonnet, said packing sleeve having an upper end portion extending beyond the upper flange of the bonnet, said upper end portion being exposed and adapted to fit a removal tool after the connecting ring and the cylindrical housing have been



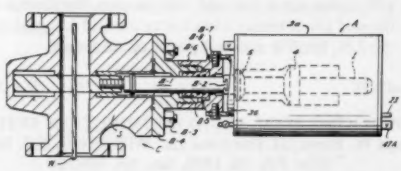
removed from the upper flange of the bonnet, and a packing assembly between the stem and the packing sleeve.

4,135,547

QUICK DISENGAGING VALVE ACTUATOR

Neil H. Akkerman, and Stephen R. Foster, both of New Orleans, La., assignors to Baker International Corporation, Orange, Calif.

Continuation-in-part of Ser. No. 777,373. This application May 31, 1977, Ser. No. 801,507
Int. Cl. F16k *43/00, 31/124*
U.S. Cl. 137—315 **28 Claims**



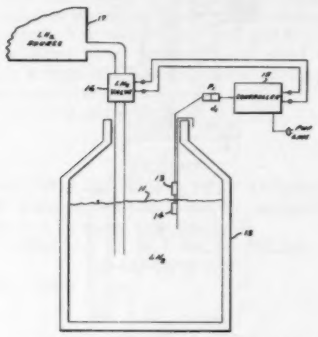
1. An actuator respondable to control fluid pressure for moving an operative means of a valve body between open and closed position comprising: a housing defining a cylindrical bore therethrough; a shaft carried in said housing and engagable with said operative means; piston means carried by one of said shaft and said housing and sealingly slidable along the other of said shaft and said housing and longitudinally movable within said cylindrical bore; and fluid chamber means companionly associated with said piston means yielding a differential force across said piston means upon variation of fluid control pressure within said actuator, said shaft being selectively shiftable longitudinally in a first direction to move said operative means to one of open and closed positions by a variation of fluid control pressure, said shaft being selectively shiftable longitudinally in a second direction to move said operative means to the other of said open and closed positions upon subsequent variation of fluid control pressure, one of said shaft and said operative means having slotted means thereon and exterior of said valve body for transverse receipt of a companion engagement means on the other of said operative means and said shaft and exterior of said valve body whereby said operative means and said shaft may be selectively placed in substantial longitudinal engagement and selectively disengaged without affecting pressure integrity of said valve body.

4,135,548

LIQUID NITROGEN LEVEL CONTROLLER

Daniel Sears, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 11, 1977, Ser. No. 823,562
Int. Cl.[2] F16K *21/18*; F17C *13/02*; G01F *23/24*
U.S. Cl. 137—392 **1 Claim**



1. A liquid nitrogen level controller for maintaining the level of LN_2 in a flask within a determined range comprising:

a. a source of LN_2;

b. means including a LN_2 valve for conducting LN_2 from the said source to the said flask;

c. a first LN_2 sensor;

d. a second LN_2 sensor;

e. means for positioning the said first and second LN_2 sensors in a substantially vertical upper and lower relationship, respectively, within the said flask;

f. means including a dual NAND Schmitt trigger circuit and a four-bit latch circuit cooperating with the said first and second sensors and the LN_2 valve for opening the said LN_2 valve when the said LN_2 level in the flask is below the said lower sensor and closing the said LN_2 valve when the LN_2 level is above the said upper sensor.

4,135,549

SWIMMING POOL FLUID DISTRIBUTION SYSTEM

Robert W. Baker, 31 Sherwood La., Willingboro, N.J. 08046

Filed Feb. 18, 1976, Ser. No. 769,906
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—552 **2 Claims**

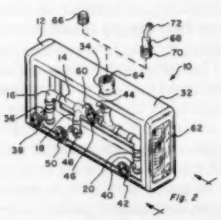


Fig. 2

1. A swimming pool fluid distribution system comprising:

a box shaped housing having a substantially hollow space therein;

a main fluid pipe mounted within the space within said housing;

at least four auxiliary fluid pipes mounted within the space within said housing and being connected to said main fluid pipe, each of said auxiliary pipes having an end which is accessible from the exterior of said housing;

three of said auxiliary pipes having ends accessible from the bottom of said housing, and one of said auxiliary pipes being an inlet pipe having an opening facing upwardly;

each of said auxiliary fluid pipes including a valve therein, each of said valves having a means connected thereto for controlling the operation of the same, said control means being accessible from the exterior of said housing;

temperature sensing means including means for sensing the temperature of the fluid in at least one of said pipes, and means for sensing the temperature of the atmosphere around said housing;

means mounted adjacent an end of said housing for visually displaying the temperatures sensed by said sensing means, and

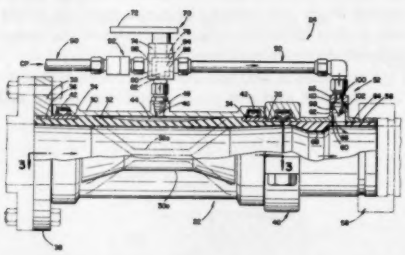
an adaptor means and a plug means, said adaptor means having a first end adapted to be connected to said opening of said inlet pipe and a second end adapted to be connected to a standard garden hose, said plug means also being adapted to be connected to said opening of said inlet pipe for closing the same.

4,135,550

PINCH VALVE CONTROL CIRCUIT

Sven E. Andersson, Chagrin Falls, Ohio, assignor to Trelleborg Rubber Company, Inc., Solon, Ohio

Filed Mar. 11, 1977, Ser. No. 776,630
Int. Cl.[2] F16K *7/07*
U.S. Cl. 137—565 **12 Claims**



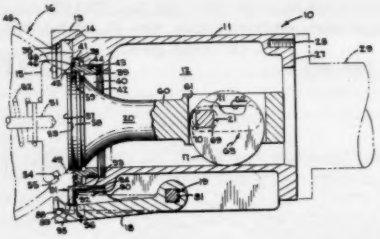
1. In a fluid flow system including main flow line means connected to a fluid supply and having a discharge end, means to pump fluid from said supply toward said discharge end, said main flow line means including normally open valve means between said supply and said pump means and including a housing supporting resilient sleeve means therein, said sleeve means alone defining the flow path through said valve means and being constrictable relative to said housing to close said valve means and to define variable volume chamber means with said housing, and means to constrict said sleeve means to close said valve means, the improvement comprising: means providing vacuum flow line means connecting said chamber means in fluid flow communication with said main flow line means at a location downstream of said constrictable sleeve means, said vacuum flow line means adapted to provide continuous open flow communication in the direction from said chamber means toward said location in the open position of said valve means for creating a vacuum in said chamber means in response to any pressure drop across said valve means, and said vacuum flow line means including control valve means to prevent flow of fluid from said main flow line means to said chamber means.

4,135,551

MODIFIED DRY-BREAK COUPLER

Houston W. Knight, Whittier, and Harold M. Gibbons, Long Beach, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 31, 1977, Ser. No. 801,718
Int. Cl.[2] F16L *29/00, 37/28*
U.S. Cl. 137—614.06 **9 Claims**



1. A dry-break coupler for attachment to an adapter that has an annular locking rib surrounding a central valve, said coupler comprising a tubular body that defines a central flow passage, an adapter latch that is pivotally mounted on the tubular body for locking the adapter in sealed contact with the coupler so that the central valve of the adapter is aligned in series with the central flow passage of the coupler, a first rotatable shaft that is mounted upon the tubular body for operating the adapter latch, a movable valve closure element that is located within the tubular body for both opening and closing the flow passage and for actuating the valved adapter, a second rotatable shaft that is mounted within the tubular body for operating the movable valve closure element, said first and second rotatable shafts having portions that extend in substantially parallel relationship, and means interconnecting the first rotatable shaft and the second rotatable shaft for both pivoting the adapter latch into locking engagement with the adapter before the valve closure element opens the flow passage and holding the adapter latch in a locked position while the flow passage is open, said shaft interconnecting means including at least one shaft control cam mounted upon said second rotatable shaft, and at least one cam follower lever mounted upon said first rotatable shaft for rotating said first rotatable shaft in response to rotation of the shaft control cam.

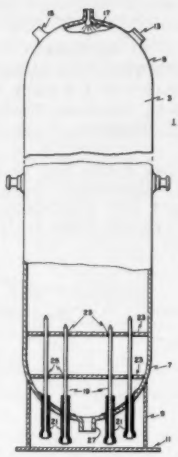
4,135,552

PRESSURIZER HEATERS

Frank J. Mendolia, Valrico, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 624,350. This application Feb. 28, 1977, Ser. No. 772,886
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—30 **5 Claims**

1. A pressurizer vessel for pressurized water nuclear reactor system comprising in combination: a vertically oriented cylindrical shell portion; upper and lower head portions attached to said shell portion; a combined fluid inlet and outlet nozzle disposed in said lower head portion in fluid communication with the pressurized water reactor system; a spray nozzle disposed in said upper head portion and connected to a supply of relatively cool fluid; a plurality of straight tubular electrical heating elements, each of said heating elements having pointed ends and a bulbous end with a heavy wall and electrical leads that connect to an electrical supply; a plurality of support plates disposed in said vessel so as to support said heating elements, said support plates having a plurality of openings for receiving said heating elements; a plurality of heater element nozzles disposed in said lower head portion of said vessel for receiving said heating elements, said heating element nozzles having an enlarged end for receiving said bulbous end of said heating elements; and sealing means disposed to form a seal between said enlarged end of said heater element nozzles and said bulbous end of said heating elements, said heater element nozzles being generally disposed parallel to said fluid inlet and outlet nozzle, and said heating elements being so disposed in said heater element nozzles that said heating elements are connected to said electrical supply external to said vessel and



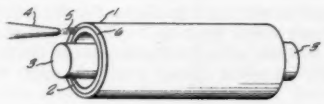
individually accessible, whereby the pressure in the pressurizer and the nuclear reactor system can be controlled by energizing the heating elements to increase the pressure within the system and utilizing the spray to reduce the pressure within the system.

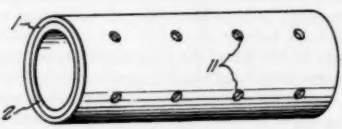
4,135,553

RECOVERABLE SLEEVE

Joseph H. Evans, Palo Alto, and Richard B. Wolfe, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 16, 1975, Ser. No. 587,267
Int. Cl.[2] F16L *9/14*
U.S. Cl. 138—141 **21 Claims**





1. A recoverable tubular article having at least one open end to receive a substrate comprising:

a tubular sleeve held under tension in an expanded condition such that upon release of the tension the sleeve tends to assume a smaller diameter;

a rigid restraint having an essentially tubular configuration disposed about the exterior of the sleeve;

a bond between the outer surface of the sleeve on the inner surface of the restraint bonding the sleeve to the restraint in its expanded condition, said bond capable of being sufficiently weakened by the application of a solvent to

allow the sleeve to pull away from the restraint and return to its smaller diameter;

said restraint having means communicating from its outer surface through said restraint to the bond between the restraint and the sleeve for transmitting the solvent to said bond.

4,135,554

DEVICE FOR DETECTING THE LOSS OF TENSION OF A WARP YARN IN A WEAVING LOOM

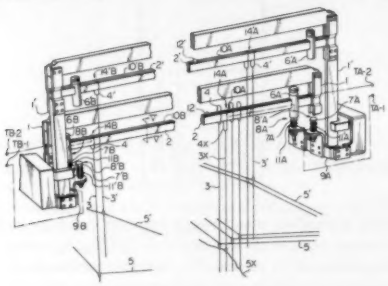
Miyuki Gotoh, 4-48-21, Midori-cho, Tokorozawa City, and Eizi Ichimatsu, 5-12-23, Midori-cho, Koganei City, Tokyo, both of Japan

Filed Oct. 7, 1977, Ser. No. 840,485

Claims priority, application Japan, Oct. 16, 1976, 51/138343[U]; Aug. 3, 1977, 52/103254[U]

Int. Cl.[2] D03D *51/32*

U.S. Cl. 139—337 **8 Claims**



1. A device for detecting the loss of tension of a warp yarn in a weaving loom with at least two heddle frames which alternatively move up and down, comprising:

at least two switching means for detecting a lower position of a corresponding heddle frame, by passing an electric current therethrough;

an upper heddle bar fixedly connected to said each heddle frame, said upper heddle bar including a plurality of first electro-conductive portions insulated from each other, each of said first electro-conductive portions being so arranged on said upper heddle bar that the entire length of said upper heddle bar is electrically divided into a plurality of portions, and a longitudinal second electro-conductive portion which extends along said upper bar, means insulating said second electro-conductive portion from said first electro-conductive portions, means for connecting said second electro-conductive portion electrically to said switching means;

a plurality of heddles, each of said heddles having upper and lower loops at both ends thereof, said upper and lower loops being loosely coupled to said upper heddle bar and a lower heddle bar of the each heddle frame respectively, the upper loop being made of an electro-conductive material, each heddle assuming an upper position with respect to the upper heddle bar when normal tension of a warp connected to the heddle is provided to the heddle for pushing up the same during which the heddle bar is at a lower position thereof, each said heddle assuming a lower position when the tension of said warp is lost during which said heddle bar is at the lower position thereof, said upper loop of a heddle being spaced from said first electro-conductive portion when the heddle assumes an upper position, said upper loop of a heddle being disposed for coming into contact with said first and second electroconductive portions of said upper heddle bar when the heddle assumes a lower position; and

display means including a plurality of electrical circuitry respectively connected to each of said first electro-conductive portions for indicating a portion of a heddle bar to which a heddle having a broken warp is connected.

4,135,555

METHOD OF FASTENING A SPIRAL ELEMENT TO A FABRIC TAPE FOR A SLIDING-CLAMP FASTENER

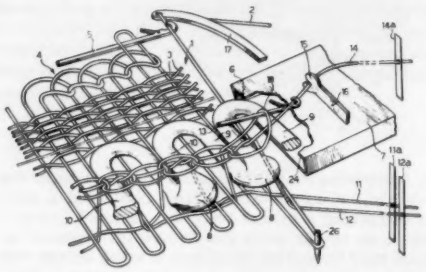
Karl Heinz Mausbach, Turin, Italy, assignor to 2 A S.p.A, Turin, Italy

Filed Mar. 18, 1977, Ser. No. 779,110

Claims priority, application Italy, Apr. 13, 1976, 67863 A/76

Int. Cl.[2] A44B *19/42*

U.S. Cl. 139—384 B **4 Claims**



1. A method for the manufacture of a fabric tape for use in making sliding-clasp fasteners, comprising a plurality of warp threads, a weft thread formed into loops and interwoven with said warp threads, a selvedge formed by connecting said weft thread loops into a chain binding and having a spiral element superimposed upon a marginal part of the tape opposite said selvedge and secured to said tape during the weaving thereof, wherein at least one of said warp threads located in said marginal part of the tape is formed into loops which are brought through said spiral element to project above the latter and locking said loops together above said spiral element by means of a locking thread which is disposed completely above said spiral element to form a chain binding fastening said spiral element to said tape.

4,135,556

CONTROL FOR THE WEFT-THREAD CARRIES IN THE SHED OF A MULTISHED LOOM

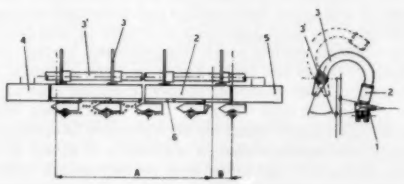
Nicola Santucci, Schio (Vicenza), Italy; Zabotin A. Aleksandrovic, Moscow, U.S.S.R.; Loschilin E. Dmitrievich, Moscow, U.S.S.R.; Galperin A. Lvovich, Moscow, U.S.S.R.; Onikov E. Archakovich, Moscow, U.S.S.R.; Sakharov B. Aleksandrovic, Mocow, U.S.S.R., and Borodin V. Alekseevich, Moscow, U.S.S.R., assignors to Nuovo Pignone S.p.A., Italy and ZNIKHBI:Tsentralny Nauchne:issledevatelsky institut khlopehatobumezhnoi promyshlennesti, U.S.S.R.

Filed Sep. 30, 1976, Ser. No. 728,241

Claims priority, application Italy, Oct. 3, 1975, 27956 A/75

Int. Cl.[2] D03D *47/26, 49/50*

U.S. Cl. 139—436 **7 Claims**



1. A method of stopping the movement of a shuttle in a loom in the path of its intended direction of movement along the

loom when an obstruction in the shed of such loom produces a force opposing the movement of the shuttle which exceeds a predetermined value, the loom being provided with a power-operated shuttle drive mechanism having a roller for drivably engaging a roller on the shuttle, the method comprising:

engaging the drive roller and shuttle roller on a line joining the rotary axes of said rollers which is inclined toward the direction of movement of the shuttle along the loom, thereby providing a vertical force component and a horizontal force component which drives the shuttle in the intended direction of movement along the loom even against obstructive forces;

interrupting the supply of power to the shuttle drive roller when the obstruction force in the shed causes the vertical force component on the shuttle to exceed the predetermined value, and

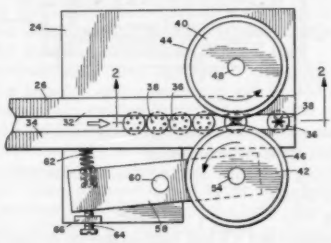
transversely moving the shuttle within the path of its intended direction of movement along the loom to thereby reduce to zero the horizontal force component on the shuttle roller.

4,135,557

HEADER LEAD ROLLER

John P. Ross, Cupertino, and Carl E. Bernardi, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 31, 1977, Ser. No. 847,402
Int. Cl.[2] B21F *45/00*
U.S. Cl. 140—105 **9 Claims**



1. A pin crimping apparatus for crimping the leads of a multiple lead header into contact, comprising:

guide means for guiding a plurality of multiple pin headers along a path with the pins of said headers oriented in a predetermined common direction,

first and second crimping wheels rotatably mounted adjacent to and disposed on opposite sides of said guide means, said crimping wheels positioned so that the rims of said wheels engage the pins of a header passing therebetween for biasing said pins toward the axis thereof into mutual engagement with one another, and means for rotating said wheels; in the same direction at different speeds.

4,135,558

MULTIPLE LEAD CUT AND CLINCH MECHANISM

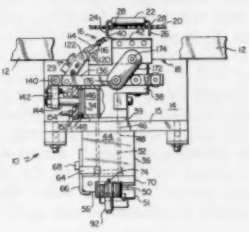
Phillip A. Ragard, Binghamton, N.Y., and Crawford A. Matson, Wyalusing, Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Continuation of Ser. No. 773,347. This application Mar. 3, 1978, Ser. No. 883,242
Int. Cl.[2] B21F *1/00*
U.S. Cl. 140—105 **14 Claims**

1. A mechanism for cutting and clinching at least one lead of a plurality of aligned leads of an electronic component, said leads inserted and projecting beneath a circuit board, said mechanism including:

a first housing assembly, said first housing assembly mounted to be raised and lowered vertically and for positioning angularly by rotation about a vertical axis within said first housing assembly;

a multiple lead cutting and clinching device, said cutting and clinching device attached to said first housing assembly and moving angularly and vertically therewith and positioned below said circuit board, said cutting and clinching device comprising a pivotably mounted cutting blade of extended length and a shear of substantially equal length, edges of said blade and said shear being parallel and space apart to admit at least one of said component leads there-



between, said blade passing in an arc over said shear in cutting relationship to cut and clinch at least one lead from said plurality of leads when said cutting and clinching device is actuated to pivot said cutting blade;

means to angularly position said first housing assembly, whereby said multiple lead cutting and clinching device is aligned to said plurality of aligned leads;

means to vertically raise and lower said first housing assembly; and

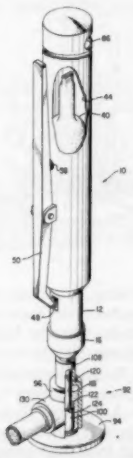
means to actuate said cutting and clinching device.

4,135,559

WATER SQUIRT TOY AND FILL VALVE COMBINATION

Donald W. Barnby, 1111 Army Navy Dr., Arlington, Va. 22202

Filed Mar. 17, 1976, Ser. No. 667,751
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—18 **13 Claims**



1. A water squirt toy apparatus comprising:

a rigid housing;

resiliently expansible and contractible water reservoir means disposed within said housing; said water reservoir means being made of an elastically expansible material to permit expansion under fluid pressure of the surface area of said

water reservoir means and having means thereon for causing expansion of said water reservoir means to initiate at a forward portion thereof, said rigid housing being of such dimensions that the expanded portion of said water reservoir means remains solely within said housing when said water reservoir means is in expanded condition.

spring biased valve means attached to said rigid housing and operatively associated with said water reservoir means for permitting or preventing discharge of water from said water reservoir means;

water discharge means fluidically connected to said water reservoir means for discharging the water therefrom when said valve means is opened; and

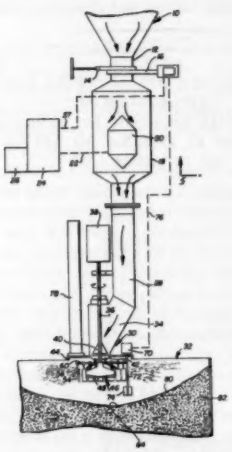
a portable fill-valve means actuatable to an open and closed position and having connection means thereon adapted to connect said fill-valve means physically and fluidically to an otherwise open source of water under pressure, said fill-valve means being normally separate from said water reservoir means and said rigid housing means and being capable of being fluidically mated with said water discharge means for controlling the filling of said water reservoir means from said water source when said fill-valve means is actuated to said open position.

4,135,560

APPARATUS FOR FILLING BULK MATERIAL CONTAINERS

Tan H. Eang, Bridgewater; John O. McDonald, Englishtown, and Kenneth C. Yi, Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,877
Int. Cl.[2] B65B *1/04*
U.S. Cl. 141—198 **3 Claims**



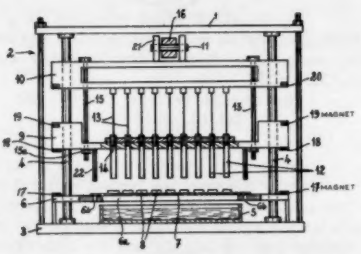
1. Apparatus for charging containers of varying configuration to maximum volumetric capacity with bulk materials comprising inlet conduit means for feeding said materials to the top of a container, rotary distributor means positioned in said conduit means, near the discharge end thereof, radially-compartmented rotor means connected to said conduit means and spaced from the discharge end thereof whereby material is received by said compartmented rotor means from said inlet means and discharged from said compartmented rotor means, a plurality of material deflecting stator means fixedly and vertically positioned around the periphery of said compartmented rotor means and each of said material deflecting stator means adapted to be oriented about its axis to be more fully opened or closed relative to said compartmented rotor means to provide the necessary deflection of material discharged from said rotor means, thereby distributing material throughout said container with the result that easier and more complete filling of containers particularly those of asymmetrical shape and volume is effected.

4,135,561

MACHINE FOR INTRODUCING MEASURED AMOUNTS OF LIQUIDS INTO VIALS AND OTHER RECEPTACLES

Henri Senelonge, Rue de la Charmette, Lagnieu, Ain, France

Filed Jul. 20, 1977, Ser. No. 817,427
Claims priority, application France, Jul. 20, 1976, 76 22786
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—234 **15 Claims**



1. A machine for introducing measured amounts of liquids into a set of receptacles, comprising:

a base carrying upwardly open container means filled with a supply of liquid;

a mounting disposed above said base;

an upper support and a lower support guided on said mounting for generally vertical reciprocation;

a set of horizontally spaced-apart syringes with barrels carried on said lower support and with plungers carried on said upper support, said supports being provided with first retaining means for releasably holding said supports together to hold said plungers fully inserted into said barrels and being interconnected by a lost-motion linkage enabling limited separation of said supports to an extent sufficient for a partial withdrawal of said plungers from said barrels;

operating means connected with said upper support for reciprocating same between a top position and a bottom position with entrainment of said lower support, said barrels dipping into said container means in said bottom position, said lower support and said base being provided with second retaining means capable or overriding said first retaining means for releasably holding said lower support onto said base during part of an ascending stroke of said upper support whereby some of the liquid in said container means is aspirated into said barrels by the rising plungers, said lost-motion linkage disengaging said lower support from said base and elevating the filled barrels during the remainder of said ascending stroke;

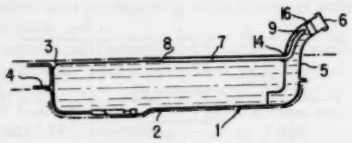
holding means carrying receptacles alignable with the filled barrels in their elevated position; and

stop means for keeping said lower support elevated during a subsequent descending stroke of said upper support whereby the contents of said barrels are discharged by said plungers into the receptacles aligned therewith.

4,135,562
ARRANGEMENT FOR FILLING AND VENTING A FUEL TANK, OF AN AUTOMOBILE IN PARTICULAR

Philippe Martineau, Nantes, and Serge Lallement, La Chapelle sur Erdre, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 11, 1977, Ser. No. 795,937
Claims priority, application France, May 11, 1976, 76 14034
Int. Cl.² B65B *3/04*; B65D *39/02*
U.S. Cl. 141—285 **2 Claims**



1. In a flexible safety fuel tank, particularly for use in automobiles, having two elastomer sheets joined at the periphery of each sheet, a filler pipe by which fuel is directed into said tank, one end of said filler pipe disposed in the interior of said tank and the other end of said filler pipe disposed exterior to said tank, and a gas cap mounted on said other end of said filler pipe, the improvement comprising:

a venting tube communicating between the interior of said tank and said filler pipe, said venting tube having one end situated at the top of the tank where gases tend to accumulate and another end opening into an upper part of the filler pipe located in the vicinity of said other end of said filler pipe; and,

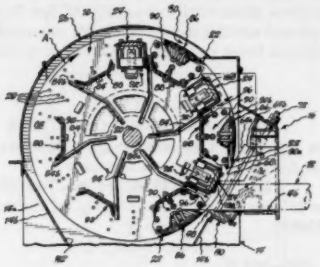
an auto-blocking valve disposed in said other end of said filler pipe just above said other end of said venting tube wherein said gas cap is manually mounted on said other end of said filler pipe by means of a twisting action, further comprising: said filler pipe having a lug integrally molded therein at a point above said auto-blocking valve; and, a rigid sleeve disposed in said upper part of said filler pipe immediately above said auto-blocking valve and in proximity with said gas cap, said sleeve serving as a base for twisting engagement with said gas cap, said sleeve having a slot in the periphery thereof for engaging said lug in said filler pipe and thereby preventing rotation of said sleeve when said sleeve is twistingly engaged by said gas cap, said slot disposed on the side of said sleeve adjacent said auto-blocking valve parallel to the axis of said filler pipe such that any externally applied force exerted on said gas cap outwardly from said filler pipe can pull the sleeve therefrom, without impairment of the auto-blocking valve.

4,135,563
APPARATUS FOR REDUCING FIBER MATERIAL TO CHIP FORM

Walter H. Maucher, Rte. #2, Cantonment, Fla. 32533

Filed Mar. 15, 1976, Ser. No. 666,701
Int. Cl.² B27C *1/00*
U.S. Cl. 144—323 **49 Claims**

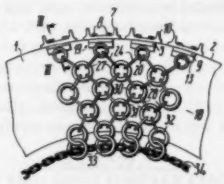
1. In an apparatus for reducing fiber material to chip form, including anvil means across which said material is to be fed, at least one knife means, and carrier means for moving said knife means along a path of travel past said anvil means for cooperation therewith to effect severing of said material into chip form, the improvement wherein said carrier means includes a rotor driven for rotation about an axis, said blade means including an elongated knife blade supported adjacent the periphery of said rotor with a knife edge thereof arranged essentially parallel to said axis and facing in the direction of rotation of said rotor for movement along a circular path of travel, said anvil means defining an arcuately concave anvil bearing surface arranged to face towards and conform to the contour of said path of travel, said anvil bearing surface including leg portions joined by a connecting portion, said leg portions being spaced apart to accommodate feeding of said material therebetween and across said anvil bearing surface, said knife blade having a lengthwise dimension sufficient to bridge between said leg portions, said knife blade including a pair of surfaces converging to define said knife edge, said carrier means positioning at least one of the converging surfaces of said knife blade for surface-to-surface bearing engagement with said anvil bearing surface in a direction extending from adjacent free ends of said leg portions towards said connecting portion, whereby to reduce to chip form said material fed across said anvil bearing surface, and means are provided for controlling the length of the chips being formed.



4,135,564
SKID PROTECTION FOR VEHICLE TIRES

Anton Müller, Aalen-Unterkochen; Hubert König, Aalen, and Helmut Magiera, Aalen-Hofherrnweiler, all of Fed. Rep. of Germany, assignors to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Continuation of Ser. No. 669,320. This application Nov. 1, 1977, Ser. No. 847,560
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2513984
Int. Cl.² B60C *7/22, 27/20*
U.S. Cl. 152—182 **5 Claims**



1. In combination with an anti-skid chain system for a vehicle tire having an axis and tire flanks as well as a circumferential running surface therewith and which provides holding means distributed over the circumference of the tire and securely anchored to the running surface of the tire, a plurality of approximately U-formed gripping profiles extending transverse to the running surface as well as projecting laterally thereof and connected to the holding means adjacent to the tire flanks, said profiles being securely anchored in the running surface whereby fastening of the gripping profiles with the holding means occurs along the circumferential direction of the tire by chain net means having improvement therewith which comprises a tension plate means including outer longitudinal edging and a ring means welded thereto at right angles to the tire axis for the chain net means provided with a plurality of annular members, two web links embodied as hook members engaged in each ring means and located at essentially right

angles to the tire flank as well as being parts of said chain net means covering the tire flank with the ring members being essentially parallel to the tire flank, adjoining pairs of hook members in tire peripheral direction being connected by one ring means, and tensioning means engaging and extending through said annular members and operable to tension said chain net means and also provided with said web links engaged with said ring means, said chain net means forming a tight mesh network substantially covering the tire flanks, said ring means and said annular members having essentially equal measurements and being equal to each other in number.

4,135,565

RECAPPED PNEUMATIC TIRE

Sjirk van der Burg, Embourg, Belgium, assignor to Uniroyal GmbH, Aachen, Fed. Rep. of Germany

Filed Nov. 29, 1976, Ser. No. 746,035

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556930

Int. Cl.[2] B60C *11/00*

U.S. Cl. 152—361 R **10 Claims**

1. A recapped pneumatic tire construction comprising a used tire body having a radial carcass and a first circumferential reinforcement belt formed with steel cords at angles between 10° and 30°, a stripped circumferential recapping surface at the periphery of said used tire body, a second reinforcement belt wound under a predetermined tension around said recapping surface for at least one full winding in spiral arrangement to provide overlapping end portions, said second reinforcement belt being unvulcanized and including heat shrinkable rubberized textile cord elements having a predetermined shrinkage at vulcanization temperatures, said textile cord elements being oriented parallel to the equatorial plane of the tire, and an unvulcanized tread strip applied around said recapping surface over said second reinforcement belt, and wherein said second reinforcing belt comprises a strip having full width for at least one full winding and an additional predetermined length of strip subdivided into two spaced marginal strips continuous with said full width strip, and wherein the overlapping end portions of said second reinforcement overlap approximately 10 to 30 mm.

4,135,566

BELTED PNEUMATIC TIRES

Gerhard F. Senger, and Dionysius J. Poque, both of Aachen, Germany, assignors to Uniroyal GmbH, Aachen, Germany

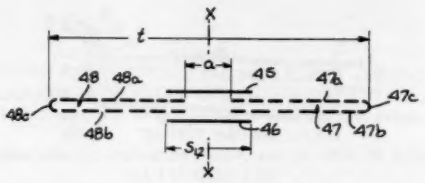
Continuation of Ser. No. 431,172, is a division of Ser. No. 238,076, Mar. 27, 1972, Pat. No. 3,831,656. This application Jun. 16, 1977, Ser. No. 806,975

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1971, 2115914

Int. Cl.[2] B60C *9/18*

U.S. Cl. 152—361 FP **11 Claims**

1. A pneumatic tire having a carcass, a tread surrounding the crown region of the carcass and a tread reinforcing breaker disposed circumferentially about the crown region of the carcass between the carcass and the tread, the breaker comprising a first ply structure of elongated metallic reinforcing elements including a plurality of layers disposed symmetrically to the equatorial plane of the tire, with opposite marginal edges, the width of the layers of the first ply structure being equal, and measuring approximately 12% to 25% of the overall total width of the tire, and a second ply structure of elongated non-metallic reinforcing elements, said second ply structure being arranged in concentric relationship to the first ply structure between two layers of the first ply structure, said second ply structure comprising at least two parts transversely discontinuous across the crown region and disposed symmetrically with respect to the equatorial plane of the tire, each said part comprising at least one layer folded back upon itself to define a folded over portion and an adjacent layer portion in contact



with each other, with a marginal fold directed toward a shoulder area of the tire and extending beyond respective said marginal edges of the first ply structure, the width of the folded over portion being equal to the width of the adjacent layer portion, the folded over portion being at a greater distance from the carcass than the adjacent layer and having a width not greater than the width of the adjacent layer, said folded over portion and said adjacent layer portion having edges directed toward the equatorial plane of the tire.

4,135,567

METHOD OF EVAPORATING AND/OR CONCENTRATING WATER-CONTAINING LIQUIDS

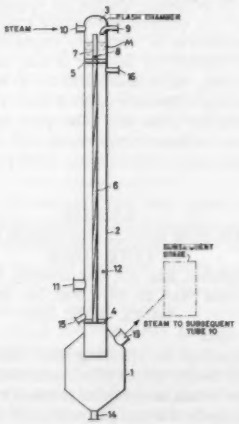
Konrad Mattern, Bad Homburg, Germany, assignor to Ekono Oy, Helsinki, Finland

Filed Apr. 4, 1977, Ser. No. 784,598

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1976, 2614587

Int. Cl.[2] B01D *1/14*

U.S. Cl. 159—165 **4 Claims**



1. A process for the concentration of a water-containing liquid material which comprises the steps of:

(a) distributing said material uniformly to inlet ends of a plurality of evaporator tubes formed with troughs and having flow cross sections increasing from the respective inlet ends to respective outlet ends with substantially constant perimeters;

(b) simultaneously introducing driving steam into said evaporator tubes at said inlet ends;

(c) controlling the velocity of said driving steam with respect to the pressure thereof to induce turbulence in the material passing into said evaporator tubes at said inlet ends and forming a mixture of said material with said driving steam;

(d) rotating said mixture about the axis of each of the evaporator tubes;

(e) passing the rotating mixture along said evaporator tubes from said inlet ends to said outlet ends and recovering a concentrated produce and vapor from said outlet ends of said tubes; and

(f) separating said concentrated product from said vapor and withdrawing said concentrated product, said material being introduced into a space communicating with said inlet ends of said evaporator tubes at a temperature such that water contained in said material is flash-evaporated in said space, said tubes being upright and each being formed with respective standpipes extending above a tube sheet, said material being uniformly distributed to said tubes by maintaining a layer of said material on said tube sheet and feeding said material tangentially to each of said pipes through an opening in the respective standpipe below the upper surface of said layer, said drive steam being introduced in step (b) into said tubes through upper open ends of said standpipes.

4,135,568

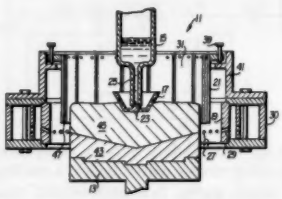
SHIELD FOR ELECTROMAGNETIC CONTINUOUS CASTING SYSTEM

Carson L. Brooks, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Nov. 15, 1977, Ser. No. 851,704

Int. Cl.[2] B22D *11/01, 27/02*

U.S. Cl. 164—147 **12 Claims**



1. A shield to be used in an electromagnetic continuous casting system of the type including a loop-shaped electromagnetic-inductor positioned about a casting station for shaping molten metal at said casting station as said molten metal is cooled, said shield comprising:

an electrically insulative body including a mounting means for mounting said electrically insulative body at said casting station;

a plurality of metallic segments attached to said insulative body, but electrically insulated from one another, said metallic segments being arranged to generally form a segmented, tubularly-shaped shield made up of said metallic segments, said segmented shield encircling said casing station to be positioned between said molten metal and said electromagnetic inductor when said continuous casting system is casting;

said insulative body including a single flat sheet of insulative material having a hole therein and wherein said metallic segments are attached at one end portion only of each of said segments to the interior surface of said hole in said insulative body to depend laterally away from said flat insulative body and to form said tubular shape having a cross sectional area which is the shape of said hole.

4,135,569

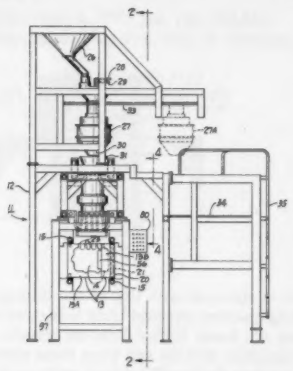
MOLDING MACHINE CLEAN OUT

Leszek R. Drobnik, and Edward J. Rebish, both of Euclid, Ohio, assignors to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Jul. 13, 1977, Ser. No. 815,230

Int. Cl.[2] B22C *15/22*

U.S. Cl. 164—158 **16 Claims**



1. In a molding machine having a mold box with a mold cavity and a blow aperture thereinto,

a magazine having an air pressure inlet and a mold material outlet and adapted to contain a predetermined quantity of mold material,

said magazine and mold box having an investment position of a flow path of mold material from the magazine outlet to the mold box blow aperture,

and blow means connected to supply air under pressure to the magazine air pressure inlet to blow the mold material from the magazine through the blow aperture with the magazine and mold box in the investment position,

the improvement of,

a diverter having a diverter passage,

movable means connected to enable and disable said diverter passage and when enabled being positioned to receive mold material from said magazine outlet,

said diverter passage being disabled during blow of the mold material from said magazine into said cavity,

and said movable means being movable to enable said diverter passage to direct a fluid through said enabled diverter passage to divert any mold material remaining outboard of said mold box blow aperture after blowing said cavity and blow aperture full.

4,135,570

FOUNDRY MOLDING INSTALLATION FOR PRODUCING BOXLESS SAND MOLDS

Günter Müller, Karlsruhe, Fed. Rep. of Germany, assignor to ARENCO-BMD Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,449

Claims priority, application Fed. Rep. of Germany, May 17, 1976, 2621935

Int. Cl.[2] B22C *15/00, 17/00*

U.S. Cl. 164—182 **7 Claims**

1. Foundry molding installation for producing boxless sand molds, comprising:

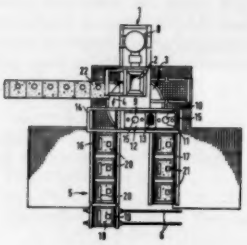
a molding machine,

a molding station having a molding sand compacting means for the simultaneous molding of an upper body and a lower body,

a shifting device for moving the molded lower body from the molding station towards a core insertion station situated outside the compacting means and at the same time transporting another lower body, which has been pro-

vided with cores and has returned from the core insertion station, back to the molding station for the application of the upper body, and

a closed circulation track for the lower bodies which is mainly disposed outside the molding machine and has two or more core insertion stations, which track has a transfer



station in common with that of the shifting device of the molding machine, the said track being provided for transporting the lower bodies from the transfer station to the core insertion stations and from these core insertion stations back to the transfer station without alteration of the relative position of the lower bodies with respect to the molding station.

4,135,571

THERMAL STORAGE SYSTEMS

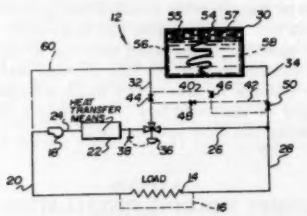
Robert T. Tamblyn, Littlebrook Farm, R.R. #2, Gormley, Ontario, Canada (L0H 1G0); James W. S. Rose, 35 Shawfield Crescent, Don Mills, Ontario, Canada (M3A 1R9); Paul N. Silverthorne, Willow Creek Farm, R.R. #1, Gilford, Ontario, Canada (L0L 1B0), and Gordon K. Broadhead, 337 Kingsdale Ave., Willowdale, Ontario, Canada (M2N 3X7)

Division of Ser. No. 567,861, Apr. 14, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 816,169

Claims priority, application Canada, Apr. 1, 1975, 223479

Int. Cl.[2] F24D *11/00*

U.S. Cl. 165—18 **8 Claims**



1. A system for conditioning a load to a first predetermined temperature wherein said load is in a closed water piping circuit, including:

pump means for pumping water about said circuit;

heat transfer means for conditioning water in said circuit prior to said load to a second predetermined temperature in order to condition said load to said first predetermined temperature;

thermal storage means including means for separating said thermal storage means into variable volume chambers, said chambers including a first chamber capable of storing water substantially at a third predetermined temperature and a second chamber capable of storing return water at a fourth temperature;

means for selectively withdrawing water at said third temperature from said first chamber and introducing it into said circuit in order to maintain said second predetermined water temperature; means for permitting a substantially equivalent amount of return water to flow into said second chamber from said circuit at said fourth temperature;

said means for separating said thermal storage means into said first and second variable volume chambers preventing blending of water at said substantially third predetermined temperature with water at said fourth temperature and varying the volume of said first and second chambers in response to water withdrawn therefrom and flowing thereinto; and

means for selectively regenerating said first chamber with water at said substantially third predetermined temperature so that said thermal storage means may contain substantially all water at said substantially third predetermined temperature.

4,135,572

METHOD AND APPARATUS FOR THE ALTERNATE HEATING AND COOLING OF A HEAT EXCHANGER OF A HEATING AND COOLING SYSTEM

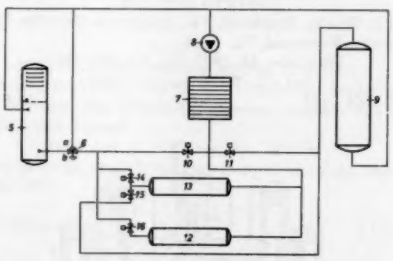
Otmar U. Schäfer, 9 Pienzenauerstrasse, Munich, Germany

Division of Ser. No. 580,700, May 27, 1975, Pat. No. 4,026,347. This application Jan. 27, 1977, Ser. No. 763,090

Claims priority, application Fed. Rep. of Germany, May 27, 1974, 2425589

Int. Cl.[2] F25B *13/00*

U.S. Cl. 165—61 **7 Claims**



1. A heating and cooling system comprising a heat exchanger, a heating circuit with a boiler, a cooling circuit with a cooler, a single pump, first and second reservoir means, means for connecting said first reservoir means selectively to the heat exchanger and to the cooling circuit each via said single pump, and means for connecting said second reservoir means selectively to the heat exchanger and to the heating circuit.

4,135,573

HEAT SHIELDING TOOL

Melville B. Sutter, 1 Cromwell Ter., Akron, Ohio 44313

Filed Oct. 29, 1976, Ser. No. 736,762

Int. Cl.[2] F28F *13/14*; B23K *5/22*

U.S. Cl. 165—80 **4 Claims**

1. A heat shielding tool for use on tubing, comprising:

A. a pair of elongate, pivotally connected handles;

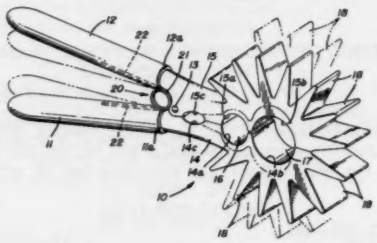
B. a pair of elongate jaws

1. secured to and projecting coaxially from said handles and

2. having opposed outer arcuate peripheral edge surfaces extending away from the central axis of each of said jaws;

C. integral heat dissipation fins carried by said jaws and

projecting radially from said outer arcuate peripheral edge surfaces and extending transversely thereof; and



D. said jaws having at least one pair of tube engaging surfaces formed opposite said outer peripheral edge surfaces.

4,135,574

DEVICE FOR RECOVERING CLEANING ELEMENTS FROM A HEAT-EXCHANGER STREAM

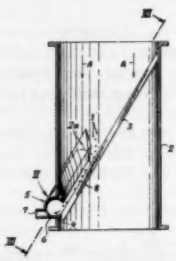
Friedrich-Wilhelm Treplin, Ratingen, and Werner Borchert, Ratingen-Tiefenbroich, both of Germany, assignors to Ludwig Taprogge, Reinigungsanlagen für Röhren-Wärmeaustauscher, Düsseldorf, Germany

Filed Mar. 25, 1977, Ser. No. 781,488

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612905

Int. Cl.² F28G *1/00*

U.S. Cl. 165—95 **10 Claims**



1. A device for recovering cleaning elements from a stream of fluid from a heat exchanger, said device comprising:

a cylindrical housing connectible to said heat exchanger and having a vertical axis, said housing being traversed by said fluid downwardly along the axis of said housing;

a separating sieve disposed in said housing and lying at an inclination to said axis while defining with the wall of said housing and at least partially ellipsoidal outline, said sieve approaching said wall at a low point of the sieve;

a collecting tube extending along said outline at said low point and formed with a longitudinal slit receiving cleaning elements from said fluid, said slit being oriented to admit a generally tangential flow of said fluid to induce said elements to pass freely from said sieve into said collecting tube; and

a discharge fitting connected to said collecting tube an extending away therefrom.

4,135,575

TUBE WALL MADE OF TUBES WHICH EXTEND PARALLEL TO ONE ANOTHER AND HORIZONTAL TO INCLINED

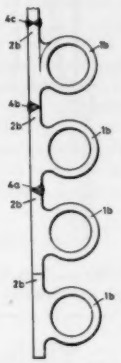
Karl H. Gersch, Ratingen, Fed. Rep. of Germany, assignor to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed May 6, 1977, Ser. No. 794,610

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621190

Int. Cl.² F28F *1/22*

U.S. Cl. 165—171 **6 Claims**



1. A tube wall suspendable from a supporting structure for assuming the forces resulting from the dead weight of the tube wall and from additional loads, comprising

a plurality of tubes extending parallel to one another and horizontal to inclined,

said tubes include oppositely directed fins, the latter having longitudinal edges welded gas-tight respectively to one another, adjacent of said tubes thereby being operatively welded gas-tight to one another,

said fins, respectively, being formed as a continuous band having a width exceeding the outer diameter of said tubes, respectively, said band being connected tangentially on an outerside of said tube, respectively, such that the thickness of the connection is at least as thick as the sum of the thickness of the tube and band, said bands being adapted to be suspended from the supporting structure,

a tension chord forming one-piece with said tubes and constituting said band, the latter having a surface facing said tubes substantially tangentially aligned with the adjacent imaginary outer periphery of said tubes.

4,135,576

MULTIPLE POCKET MANDREL WITH FLUID BYPASS

Gilbert H. Tausch, Sugar Land, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Jan. 3, 1978, Ser. No. 866,584

Int. Cl.² E21B *23/02*

U.S. Cl. 166—117.5 **9 Claims**

1. A mandrel for use in a well tubing comprising,

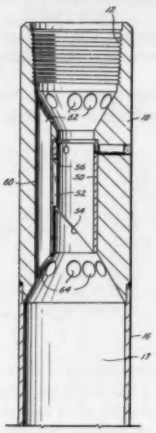
a mandrel body including upper and lower connecting means for connecting the mandrel in a well tubing,

said body having an open bore therethrough for communication with the well tubing,

a plurality of flow control device receiving pockets offset relative to the open bore, and

a plurality of fluid passageways offset from the open bore, said passageways having first and second ends, the first ends communicating with the open bore at a position

adjacent the upper end of the pockets and the second ends communicating with the open bore at a position adjacent



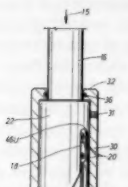
the lower end of the pockets for increasing the area for fluid flow through the mandrel.

4,135,577

TOOL CENTRALIZER GUIDE HAVING A J-GROOVE RELEASE

Paul M. Nelson, and Carl P. Hutchinson, both of Houston, Tex., assignors to Wilson Industries, Inc., Houston, Tex.

Filed May 11, 1977, Ser. No. 795,950
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—241 **4 Claims**



1. Apparatus for centrally guiding within a well bore a tool having a radially outwardly extending lug member thereon comprising:

a substantially cylindrical sleeve sized to concentrically fit about a tool having a radially outwardly extending lug thereon, said sleeve having a groove therein sized to receive the lug, said groove including a first, axially extending, closed slot and a second, axially extending open slot, said axially extending slots being circumferentially spaced from each other, and a transverse slot connecting said first to said second axially extending slots;

an outer jacket mounted concentrically about said sleeve and adapted to totally enclose said slots disposed therein; and,

a radially flared centralizer element mounted to said sleeve, said centralizer disposed so as to fit within close juxtaposition with the well bore to minimize the annular space between the centralizer and the bore adjacent all points along the radially outward edge thereof to maintain said jacket and sleeve centrally located with respect thereto.

4,135,578

METHOD OF PREPARING A WET COAL SEAM FOR PRODUCTION IN SITU

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Continuation-in-part of Ser. No. 744,258, Nov. 23, 1976, Pat. No. 4,093,025, which is a division of Ser. No. 595,335, Jul. 14, 1975, Pat. No. 4,069,868. This application Jan. 20, 1978, Ser. No. 870,865
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—245 **7 Claims**

1. In a wet coal seam underground wherein the prevailing directions of maximum paths of permeability have been established, a method of initiating production of the coal in situ comprising the steps of

drilling a first pattern of production wells from the surface of the earth into the wet coal seam, the pattern of production wells being aligned along the prevailing directions of maximum paths of permeability in the coal,

drilling a second pattern of production wells from the surface of the earth into the coal seam, the second pattern of production wells being adjacent to the first pattern of production wells,

equipping each production well to permit injection of fluids into the coal seam and to withdraw fluids from the coal seam, with the resultant capability for each of the production wells to be utilized as an injection well or as a withdrawal well,

withdrawing water from the coal seam through the said second pattern of production wells with the resultant lowering of the water table,

linking the production wells of the first pattern through the coal seam, the said linking being accomplished along the maximum paths of permeability in the coal, then

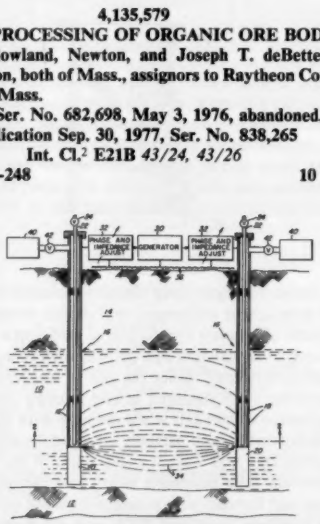
establishing a first reaction zone in the coal.

4,135,579

IN SITU PROCESSING OF ORGANIC ORE BODIES

Howard J. Rowland, Newton, and Joseph T. deBettencourt, West Newton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 682,698, May 3, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,265
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—248 **10 Claims**



1. The method of producing organic products from a body of oil shale beneath an overburden comprising:

producing fracturing in said body by producing an electric field in said body having a frequency in the frequency range between 100 kilohertz and 100 megahertz between a

plurality of conductive members extending through said overburden into said body and spaced apart by a distance of less than an eighth of a wave length of said frequency in said body, with regions of said field varying in intensity in mutually orthogonal directions; and

supplying additional heat to said body.

4,135,580

PLANT EXTRACTOR

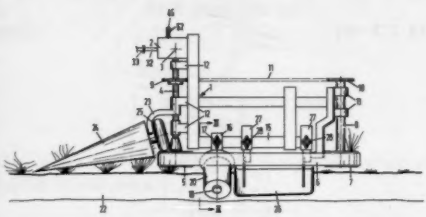
Aries Bouwman, Wageningen, Netherlands, assignor to Drost Machines B.V., Rhenen, Netherlands

Filed Oct. 29, 1976, Ser. No. 736,848

Claims priority, application Netherlands, Oct. 29, 1975, 7512656

Int. Cl.² A01D *25/00*

U.S. Cl. 171—61 **20 Claims**



1. A machine adapted to be moved in a given direction for pulling off green plants from tuberous crops which remain in the ground during the operation of the machine, in particular the plants of seed potatoes, said machine comprising: a frame; at least two plant extracting members comprised of endless belts supported by said frame in such manner that longitudinally-extending first portions of the belts face each other and longitudinally-extending second portions of the belts face away from each other, said endless belts being driveable in opposite directions in an endless substantially horizontal orbit and having a confluent path in which said first portions cooperate with each other for clamping plants therebetween, said plant extracting members, in their confluent path, being movable entirely or substantially entirely in a horizontal direction opposite to the direction of travel of the machine and at a speed higher than the speed of travel of the machine; means supported by said frame and having portions spaced from the second portions of said plant extracting members for compressing the ground on opposite sides of said confluent path; and means supported by said frame and positioned, in the direction of travel, in front of said first portions of the belts for moving tops of plants into an upright position in the region of said confluent path so that the plant tops are engageable by the plant extracting members.

4,135,581

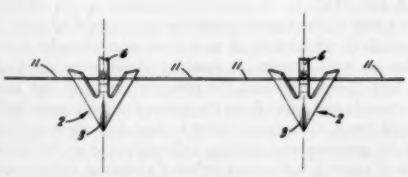
WEEDING ROD UNIT FOR PLOWS

Elden C. Beale, 2445 W. Elm St., Lodi, Calif. 95240

Filed Sep. 9, 1977, Ser. No. 831,985

Int. Cl.² A01B *39/18*

U.S. Cl. 172—142 **1 Claim**



1. A weeding rod unit for use in connection with a plow which includes a plowshare secured to an upstanding shank adapted for attachment to a tractor-drawn tool bar; the weeding rod unit comprising a rigid arm adapted to project rearwardly from the shank adjacent but above the plowshare, means in part integral with the forward end of the arm to mount the latter at said end on the shank, individual spring rods projecting in alinement laterally and oppositely outwardly from the arm in a plane to run in weeding relation on or slightly below ground level when the plowshare is at working depth, the rods being included in a continuous rod length a central portion of which is wound as a vertical-axis spring coil, the vertical-axis spring coil symmetrically overlying the rear of the arm and resting thereon, and means securing the vertical-axis spring coil on the arm; said securing means being a washer engaging the vertical-axis spring coil from above, and a bolt extending centrally through the washer and coil clamping the latter to said arm; the upper face of the arm being of a lateral width at least equal to the outside diameter of the vertical-axis spring coil, the washer being of a diameter at least equal to said outside diameter of such vertical-axis spring coil, and adjacent faces of the washer and arm being circumferentially notched for matching reception of the coil and in which notches said coil is bound.

4,135,582

PLOUGH

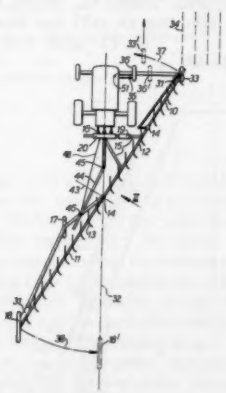
David J. Farrant, Welshes Farm, Clatworthy, Wiveliscombe, Somerset, England

Filed Dec. 16, 1976, Ser. No. 751,483

Claims priority, application United Kingdom, Dec. 18, 1975, 51911/75

Int. Cl.² A01B *69/00*

U.S. Cl. 172—280 **11 Claims**



1. A plough comprising:

two booms carrying plough shares; and

a frame mounted on one of said booms,

said two booms being pivotally connected at adjacent ends, one boom extending from the pivot point forwardly and to one side of said frame and having an end forward of the frame with respect to the direction of plowing, and the other boom extending from the pivot point rearwardly and to the other side, either boom being provided with a ground wheel at the end remote from said pivot point,

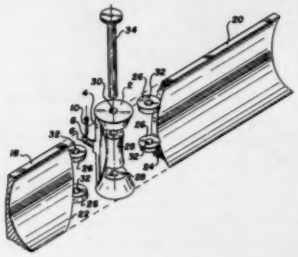
said frame including means for attachment to a standard three-point suspension on a tractor, said means for attachment being substantially in line with said pivot point with respect to the direction of ploughing.

4,135,583

BULLDOZER BLADE

Clarence A. Becker, Box 249, Chase, B.C., Canada (V0X 2W0)

Filed Apr. 4, 1977, Ser. No. 784,349
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—802 10 Claims



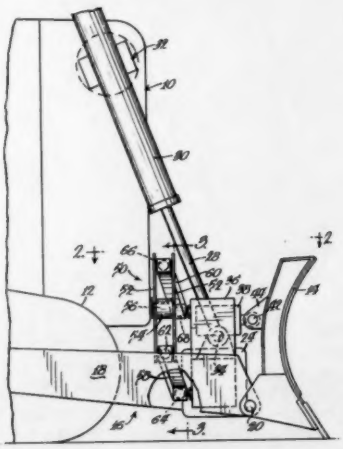
1. A blade for a bulldozer comprising a post of variable, substantially circular cross section varying from a maximum at the top and the bottom uniformly to a minimum at the middle;
means to permit attachment of said post to a bulldozer;
a blade member pivotally mounted to each side of the post, each blade member being shaped at its inner end to correspond to the shape of the surface of the post;
the blade being adapted to attach to means to pivot each blade member independently about the post whereby, upon pivoting, each blade moves around the post while at least maintaining a uniform, small distance from said post.

4,135,584

BLADE STABILIZING LINKAGE FOR A BULLDOZER

Roger M. Smith, and Gary P. Freese, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 19, 1977, Ser. No. 834,097
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—804 7 Claims



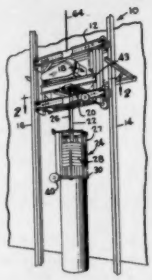
1. A bulldozer comprising:
a vehicle frame;
a dozer blade forwardly of said frame;
a lift linkage movably secured to said frame and including two spaced arms extending longitudinally of said frame and connected to said blade;
at least one motor means connected to said frame and to one of said blade and said lift linkage for selectively elevating said blade relative to said frame; and
stabilizing means interconnecting said frame and one of said blade and said lift linkage including a first link mounted intermediate its ends on said frame for rotation about an axis extending generally longitudinally of said frame, and second and third elongated links each having an end pivoted to said first link on opposite sides of said axis, and extending in opposite directions therefrom, the other ends of said second and third links being pivoted to one of a corresponding arm and said blade.

4,135,585

DRILL RIG-CASING DRIVER ASSEMBLY

Gary L. Wagner, P.O. Box 902, Burlington, Iowa 52601

Filed Sep. 9, 1977, Ser. No. 832,102
Int. Cl.[2] E02D *7/18*
U.S. Cl. 173—49 7 Claims



1. An improved drill and casing driver assembly which is portable, non-truck mounted, and easily installed for use in constructing hydraulic elevators in existing buildings, to forcibly insert casing into a well hole as the well hole is being drilled, said assembly comprising: a frame, a drilling device rotatably mounted on said frame for drilling a well hole, power means mounted on said frame and having a rotatable output shaft adapted for rotatably driving said drilling device, and a casing driver assembly having a cam means fixed to the output shaft, a cam follower mounted on said frame and engageable with said cam means to cause the cam follower to move as the output shaft rotates, and an impact weight operatively connected to said cam follower and adapted to be repeatedly dropped against the casing to drive the casing into the well hole as the well hole is being drilled by the drilling device to permit simultaneous insertion of the casing into the well hole as the well hole is being drilled.

4,135,586

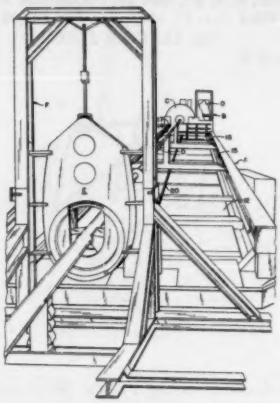
APPARATUS FOR CONSTANTLY ROTATING CASING DURING INSTALLATION

Martin D. Cherrington, 1111 S. Post Oak Rd. #225, Houston, Tex. 77056

Filed Mar. 18, 1977, Ser. No. 778,914
Int. Cl.[2] E21B *19/16*; E21C *19/00*
U.S. Cl. 173—147 6 Claims

1. In a drill rig for inserting pipe in an inverted, arcuate path underneath an obstacle such as a river wherein said drill rig includes an inclined ramp, a rotating chuck attached to said ramp, said chuck provided for powered rotation and movement towards and away from the ground along a path defined over said ramp, the improvement to said drill rig comprising: means for grasping and rotating only said pipe at the forward portion of said rig; and means defining a vertical railway proximate the leading end of said ramp, said vertical railway supporting said grasping and rotating means and permitting up and down movement of said grasping and rotating means along

a path approximately normal to the axis of said pipe; so that upon actuation of said grasping and rotating means, torque



forces can be applied to said piping independent of said chuck attached to said ramp.

4,135,587

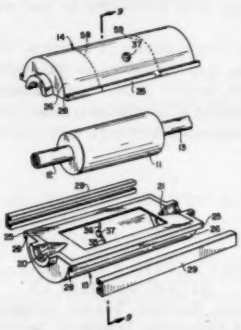
CASES FOR ENCLOSING SUBSTRATES

Stephen H. Diaz, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 638,687, Dec. 8, 1975, abandoned. This application Apr. 12, 1977, Ser. No. 786,835

Int. Cl.[2] H02G *15/18*

U.S. Cl. 174—92 **42 Claims**



1. A case for enclosing a short length of at least one elongate substrate in a sealed hollow enclosure, the case having end portions comprising deformable sealing members for sealing around the substrate and a center portion for forming said hollow enclosure which case comprises:

(a) at least one wrap-around body section which can be placed in an assembled position in which the contiguous surfaces thereof can be joined to each other along at least one junction which extends longitudinally of the case;

(b) a plurality of end sections, each of which comprises a transversely-extending deformable sealing member which is deformable at or above ambient temperature and in the assembled position is deformed into a configuration in which there is a seal between the sealing member and the substrate and in which an increase in the pressure within the hollow space increases the forces maintaining the sealing member in contact with the substrate, the surface of the sealing member which contacts the substrate being composed of a material which is flowable at a temperature at which the member is deformable; and

(c) assembly means for maintaining the body sections and end sections in the assembled position.

42. A method of enclosing a short length of at least one elongate substrate in a sealed hollow enclosure which comprises positioning about said substrate a case having end portions comprising deformable sealing members for sealing around the substrate and a center portion for forming said hollow enclosure, which case comprises:

(a) at least one wrap-around body section which can be placed in an assembled position in which the contiguous surfaces thereof can be joined to each other along at least one junction which extends longitudinally of the case;

(b) a plurality of end sections, each of which comprises a transversely-extending deformable sealing member which is deformable at or above ambient temperature and in the assembled position is deformed into a configuration in which there is a seal between the sealing member and the substrate and in which an increase in the pressure within the hollow space increases the forces maintaining the sealing member in contact with the substrate, the surface of the sealing member which contacts the substrate being composed of a material which is flowable at a temperature at which the member is deformable;

(c) assembly means for maintaining the body sections and end sections in the assembled position; and causing the sealing members to deform into sealing contact with the substrate and the body and end sections to seal to each other.

4,135,588

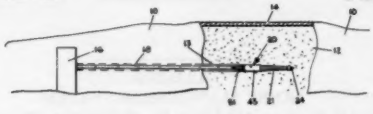
BORING AND COMPACTING TOOL

Robert L. Wagner, Grand Rapids, Mich., assignor to Schreves, Inc., Grand Rapids, Mich.

Filed Nov. 21, 1977, Ser. No. 853,266

Int. Cl.[2] E21B *11/02*

U.S. Cl. 175—19 **5 Claims**



4. In an auger for use with a rotating bore line for boring a hole through the earth and having means for connecting the auger to the bore line, the front end of the auger is tapered and has a cutting edge for cutting into the earth, a tapered, threaded flight spirally disposed about the rotational axis of the auger behind the cutting edge for threading the auger through the earth, and a cylindrical expander section behind the threaded flight for compacting the earth about the hole to form an expanded hole, the improvement comprising:

an elongated shaft having an elongated tapering front end extending from a central portion and a rear portion extending rearwardly from the shaft;

the expander section includes a separate annular collar with a cylindrical outer surface and a central axial opening positioned on the central portion of the elongated shaft for axial movement with respect thereto;

means for removably securing the collar to the central portion of the shaft to tightly retain the collar in fixed position on the shaft;

the threaded flight comprises a tapered helical spring extending from the collar to the front end of the shaft;

a rear helical spring axially wrapped around the rear portion of the shaft behind the collar;

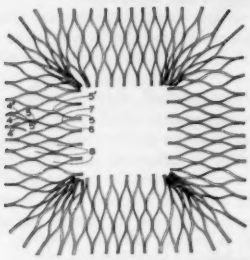
the outer diameter of the collar being at least as large as the diameter of the rear helical spring adjacent the collar; and

the rear helical spring being spiralled in the same direction as the helical spring forming the threaded flight.

4,135,589
INGOT MOULD SEAL

Roderic H. Hammerton, Bednall, England, assignor to Foseco International Limited, England

Filed Feb. 17, 1978, Ser. No. 878,953
Claims priority, application United Kingdom, Feb. 18, 1977, 6820/77
Int. Cl.[2] B22D *33/04;* F16J *15/06*
U.S. Cl. 277—1 5 Claims

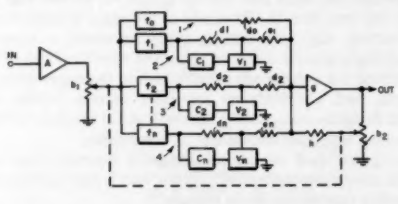


1. A method of forming a seal between adjacent parts of a metallurgical mould assembly comprising the steps of selecting at least one pack of flexible strips interlined in face-to-face relation, expanding the pack to form at least one array of substantially identical cells, arranging the expanded pack on one of said parts between which the seal is to be formed with the longitudinal edges of the strips on one side of the expanded pack resting on said one part of said mould assembly and bringing said parts of said mould assembly one towards the other so as to crush said expanded pack between said parts while generally maintaining a cellular structure.

4,135,590
NOISE SUPPRESSOR SYSTEM

Clifford F. Gaulder, 463 Salem St., Wilmington, Mass. 01887

Filed Jul. 26, 1976, Ser. No. 708,894
Int. Cl.[2] H03G *3/34*
U.S. Cl. 179—1 P 13 Claims

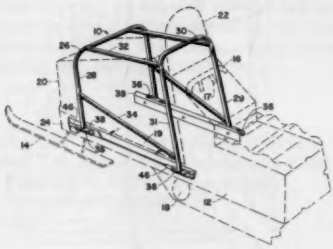


1. An audio frequency noise suppressor system comprising first means for receiving and voltage-dividing an input audio signal, a plurality of parallel-connected second means comprising bandpass filters for spectrally-dividing the voltage-divided signal into a corresponding plurality of adjacent band signals, a plurality of third means each coupled to a corresponding second means for attenuating the respective band signal, one or more fourth means, each coupled to a respective coupled second and third means, for essentially linearly controlling the attenuation of said third means by substantially decreasing the magnitude of said band signals from said third means only when the magnitude falls below a predetermined noise threshold, and fifth means for combining said band signals from the outputs of said plurality of third means.

4,135,591
SNOWMOBILE ROLLOVER PROTECTIVE STRUCTURE

Keith F. Eberle, R.R. #2, Box 59, Pocahontas, Iowa 50574

Filed Oct. 17, 1977, Ser. No. 842,982
Int. Cl.[2] B60R *27/00*
U.S. Cl. 180—5 R 2 Claims



1. In a snowmobile having a frame, an engine mounted on the forward end of said frame; a hood over said engine; a windshield extending above said hood; front steering skies, a handlebar for angularly moving said skies; controls on said handlebar; a protective cage-like structure comprising a rigid frame including first and second spaced vertical members adapted to be mounted and secured removably to said frame on opposed sides adjacent the front end thereof; said first member straddling said hood; said second member extending above said handlebar but below the upper end of said windshield; rigid lateral supports extending between said first and second members and welded thereto; mounting means fixed horizontally to the lower part of said snowmobile on each side thereof; and securing means at the lower end of said first and second members for securing same removably to said mounting means, wherein

said mounting means consist of inverted "L" shaped members having spaced notches in the upper part thereof, tubular rods welded above said notches; said securing means consisting of tubular sleeves welded to the ends of said first and second members, said sleeves fitting on said rods.

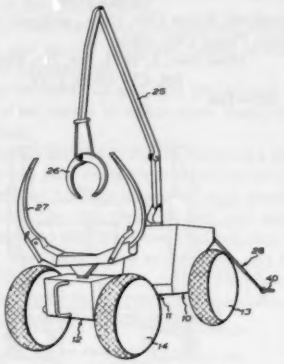
4,135,592
FOUR-WHEEL-DRIVE ARTICULATED FRAME STEERING VEHICLE

Alf G. R. Wincent, Burtrask, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag, Trelleborg, Sweden

Filed Jun. 15, 1977, Ser. No. 806,872
Claims priority, application Sweden, Jun. 18, 1976, 7606987
Int. Cl.[2] B62D *51/04;* B60K *41/00*
U.S. Cl. 180—19 H 8 Claims

1. A four-wheel-drive articulated frame steering vehicle for material handling in difficult terrain, comprising a vehicle motor, four driven wheels, hydraulic power transmission means connecting said vehicle motor to the four driven wheels, a first valve means included in the hydraulic power transmission means for forward and reverse movement, a hydraulic, articulated frame-steering motor, a second valve means included in the power transmission means and connected to said frame-steering motor for turning the vehicle to the left and right, said vehicle being provided with a steering and control apparatus which includes a control bar assembly which is connected to both said valve means and projects forwardly of the vehicle, said control bar assembly having a control bar, a pivotally mounted tubular sleeve receiving said control bar for longitudinal shifting movement therein and pivotal movement therewith, means for actuating the second

valve means in response to pivotal movement of sleeve for turning to the left and right, said control bar being connected



to the first valve means via a slot and pin connection for permitting swinging of the control bar.

4,135,593

ELECTRICALLY DRIVEN VEHICLES

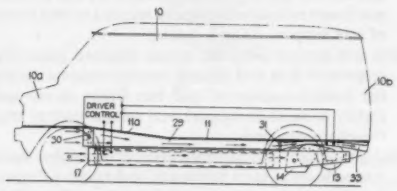
Ronald Fowkes, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Aug. 31, 1976, Ser. No. 719,305

Claims priority, application United Kingdom, Sep. 10, 1975, 37177/75

Int. Cl.[2] B60L *11/18*

U.S. Cl. 180—65 R **5 Claims**



1. An electrically driven vehicle including a support structure, a plurality of rechargeable batteries mounted in the support structure and each having a battery top and a lower casing, an electric motor unit carried on the vehicle, a driver control whereby the electric motor can be regulated, connection means between the batteries and the electric motor unit for transmitting power from the batteries to run the electric motor unit, two separate compartments defined in the support structure, the battery tops being disposed in one of the compartments and the lower casings of the batteries being disposed in the other of the compartments, ventilation openings provided in said structure for allowing cooling air to flow through both said compartments, and fan means to force air through said compartment in which the battery tops are disposed.

4,135,594

ITINERARY FOLLOWING DEVICE FOR A VEHICLE

Maurice Lestradet, 291 rue du Marechal de Lattre de Tassigny, Fere Champenoise, France (51230)

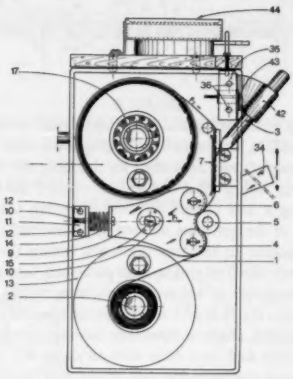
Filed Dec. 1, 1976, Ser. No. 746,633

Claims priority, application France, Nov. 28, 1975, 75 36474

Int. Cl.[2] B62D *5/04*

U.S. Cl. 180—98 **11 Claims**

1. An itinerary following device for a vehicle with a driving station and having wheels for contacting the ground, and in particular an automotive vehicle such as an agricultural machine, adapted to permit the vehicle to follow with fidelity in the course of a passage of the vehicle over a given surface, a previously recorded path, said device comprising: recording means for recording the path to be followed and means for comparing the position of the vehicle in the course of its passage with the recorded path for the purpose of actuating steering means for steering the vehicle, and causing the vehicle to be made to travel in the opposite direction relative to the direction of the recorded path, and indicating means for indicating successive directions taken by said vehicle, including a



graduated magnetic element, the magnetic element being mounted on the vehicle by a support made from a non-magnetic material and located at a sufficient distance from the metallic mass of the vehicle to ensure that the magnetic influence of the metallic mass is negligible, said indicating means further comprising a viewing means for viewing from said driving station, including a magnifying optical system disposed in front of the graduated magnetic element and at least one viewing element disposed at the driving station.

4,135,595

GAS-CUSHION VEHICLES

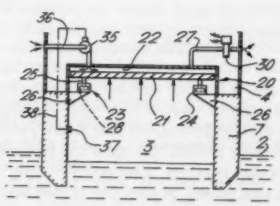
Edward G. Tattersall, Southampton, England, assignor to Hovermarine Transport Limited, Hampshire, England

Filed Nov. 26, 1976, Ser. No. 745,048

Claims priority, application United Kingdom, Nov. 28, 1975, 48910/75

Int. Cl.[2] B60V *1/18*

U.S. Cl. 180—117 **7 Claims**



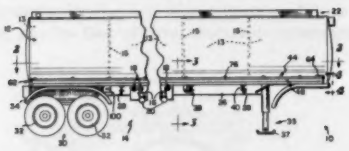
1. A gas-cushion vehicle provided with means responsive to changes in cushion pressure whereby the cushion volume is increased as cushion pressure tends to increase, and vice-versa, said means comprising a panel movable in a recess defined by the bottom surface of the vehicle body, and means for avoiding pressure build-ups in said recess.

4,135,596

HOSE TRAY FOR LIQUID TRANSPORTER

Glen R. Silba, R.R. #2, Box 36, Brownsburg, Ind. 46112

Filed Nov. 25, 1977, Ser. No. 854,826
Int. Cl.[2] B60P 3/22; B60T 7/12
U.S. Cl. 180—111 9 Claims



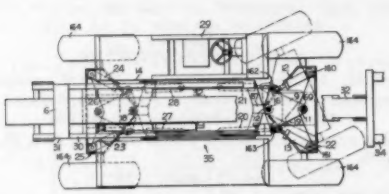
1. A tray for storing fluid fill and drain hose for a fluid transport vehicle, the vehicle including a tank for containing a fluid for transport, and an orifice for draining the fluid from the tank, the tray being attached to the vehicle and including a cover having a first closed position covering the tray to prevent access to the contents thereof and a second open position permitting access to the tray contents, means for moving the cover between the first and second positions, and switch means actuable selectively to actuate the moving means to move the cover between the first and second positions, the tray comprising an elongated, shallow structure having two longitudinally extending sides and two ends and an open top side, and the cover covering the open top side of the tray, and further comprising hinge means for connecting the cover to one of said ends or said longitudinal sides.

4,135,597

CHASSIS OSCILLATION CONTROL ON AN ARTICULATED VEHICLE

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 29, 1977, Ser. No. 865,676
Int. Cl.[2] B62D 5/06
U.S. Cl. 180—139 14 Claims



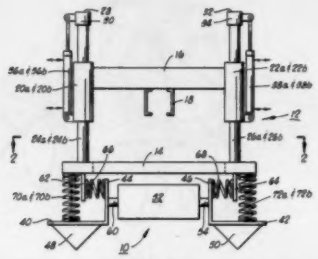
1. An articulated vehicle comprising, means defining an axis of articulation including a vehicle chassis, an upper and a lower vertically spaced bearing mounted on said chassis defining an articulating axis, at least one of said bearings comprising a universally pivotal bearing, an axle means pivotally connected to the universally pivotal bearing, a link pivotally connected to the other of said bearings, a bearing pivotally connecting said link to said axle means, at least one of said bearings connected to said link comprising a universally pivotal bearing, a steering mechanism connected between said chassis and said axle means selectively pivoting said axle means relative to said chassis for steering said vehicle, a chassis oscillation control mechanism for selectively pivoting said link for controlling the relative position of said link relative to said axle means and tilting the articulating axis to control the level of said chassis relative to said axle means.

4,135,598

LIFT AND ISOLATION SYSTEM FOR SEISMIC VIBRATOR

Jay H. Stafford, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 3, 1977, Ser. No. 848,225
Int. Cl.[2] G01V 1/14
U.S. Cl. 181—114 10 Claims



1. Lift and isolation apparatus for a carrier frame supported seismic energy transducer, comprising:

first and second support column means having top and bottom ends and being vertically disposed on each side of said frame;

means securing each of said support column means to said carrier frame and including hydraulic means for raising and lowering the support column means relative to said carrier frame;

box frame means having a top surface and a bottom surface and transversely disposed under said frame and said first and second support column means, the top surface of said box frame means being rigidly secured to said bottom ends of said support column means;

first and second baseplate means disposed generally below respective first and second support column means under the bottom surface of said box frame means and being rigidly secured to support said seismic energy transducer therebetween; and

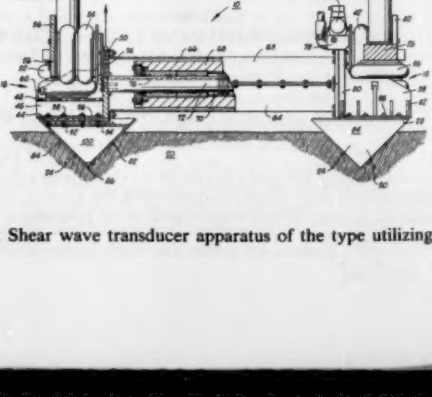
first and second spring means providing resilient connection, respectively of both horizontal and vertical forces, of said first baseplate means to the bottom surface of said box frame means, and said second baseplate means to the bottom surface of said box frame means.

4,135,599

BASE PLATE AND EARTH COUPLING ASSEMBLY FOR SHEAR-WAVE TRANSDUCERS

Delbert W. Fair, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Nov. 3, 1977, Ser. No. 848,222
Int. Cl.[2] G01V 1/14
U.S. Cl. 181—121 10 Claims



1. Shear wave transducer apparatus of the type utilizing a

reaction mass that is hydraulically driven in reciprocation relative to one or more double rod end pistons, comprising:

first and second baseplate means;

first and second cleat means each secured to a respective one of the first and second baseplate means to extend into earth surface engagement;

means bearing vertically on said first and second baseplate means and cleat means to effect shear wave transducer earth coupling;

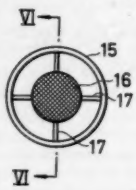
an end plate rigidly secured to said baseplate at a right angle thereto, said end plate being securely affixed to one end of each said piston; housing means of rigid material connected between the end plates of said first and second baseplate means to totally enclose said reaction mass and said one or more double rod end pistons; and hydraulic fluid ports formed in each end plate of said first and second baseplate means for coactive communication through said one or more double rod end pistons.

4,135,600

LOUDSPEAKER SYSTEM

Kenji Ogi, and Masakatsu Sakamoto, both of Tokyo, Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 12, 1977, Ser. No. 758,757
Claims priority, application Japan, Jan. 19, 1976, 51-4364[U]
Int. Cl.[2] H05K *5/00*
U.S. Cl. 181—156 **1 Claim**



1. A bass-reflex loudspeaker system comprising a cabinet, a loudspeaker opening in said cabinet, a loudspeaker mounted over said opening in said cabinet, a further opening in said cabinet, a hollow duct mounted in said further opening and substantially extending into said cabinet, and a standing wave prevention member made of a sound absorbent material and disposed within and removed from the interior wall of said duct in spaced relation thereto, said standing wave prevention member being smaller in volume than said duct and comprising a solid cylinder with a diameter smaller than that of said hollow duct, the length of said solid cylinder being substantially as long as said hollow duct and being coaxially disposed and mounted therein.

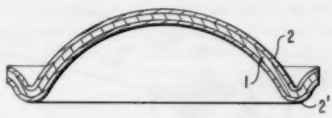
4,135,601

BORON COATED DIAPHRAGM FOR USE IN A LOUD SPEAKER

Tsunehiro Tsukagoshi; Teruo Touma, and Masami Kimura, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 699,399, Jun. 24, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,578
Claims priority, application Japan, Jun. 24, 1975, 50-76816
Int. Cl.[2] G10K *13/00*; H04R *7/12*
U.S. Cl. 181—167 **12 Claims**

1. In a dome-shaped diaphragm of a loud speaker, said diaphragm being of the type constructed of a thin sheet of material shaped into the form of the diaphragm, the improvement characterized by, a coating on at least a part of one surface of said thin sheet of material, said coating being a material selected from the group consisting of boron, an alloy having



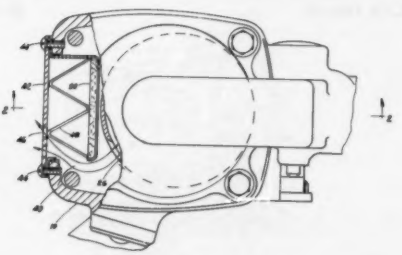
boron as its major component and a chemical compound of boron.

4,135,602

SELECTIVELY POSITIONED MUFFLER

Melvin D. Clark, West Unity, Ohio, assignor to The Aro Corporation, Bryan, Ohio

Filed May 20, 1977, Ser. No. 798,994
Int. Cl.[2] F01N *3/00*
U.S. Cl. 181—230 **6 Claims**



1. In an air tool including a rotary vane air motor of the type having a casing, said casing having air exhaust ports, the improvement of integral and variable muffler means comprising, in combination:

a housing for the motor, said housing surrounding the casing to define a chamber surrounding the motor, said housing including an air exhaust opening from the chamber to the atmosphere, said opening generally opposed to the motor exhaust ports; and

a muffler shell member positioned in the housing opening and dished inwardly toward the casing, said shell member including a bottom panel which extends in close proximity to the casing and a sidewall from the bottom panel to the opening whereby the shell divides the chamber, said shell including an air passage through part of the side wall, said shell being selectively positioned in the opening to place the shell air passage adjacent the exhaust ports of the motor or distal from the exhaust ports to thereby control the path of exhaust air travel from the exhaust ports, through the chamber and through the air passage.

4,135,603

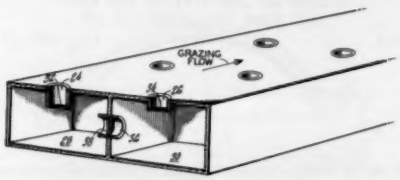
SOUND SUPPRESSOR LINERS

Lee W. Dean, III, South Glastonbury, and Aldo A. Peracchio, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 19, 1976, Ser. No. 715,816
Int. Cl.[2] E04B *1/99*; G10K *11/04*
U.S. Cl. 181—286 **9 Claims**

1. A liner for absorbing sound in the low frequency spectrum including a cellular material having individualized cavities, each of said cavities being enclosed by side walls, top wall and bottom wall, openings in said top wall for communicating each of said cavities with grazing air flow, said cavities being sized so as to be tuned for a predetermined frequency spectrum, means acoustically coupling said adjacent cavities for adjusting

said tuning of said liner for the frequency spectrum actually encountered and said cavities being acoustically asymmetrical



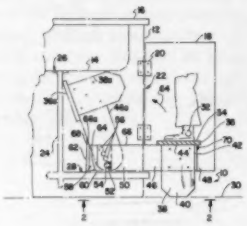
so that said acoustically coupling means pumps air at a given frequency for dissipating sound energy.

4,135,604

VANITY STORING STEP

Francis Ryan, 50 Watson Crescent, Brampton, Canada (L6W 1E7)

Filed Feb. 6, 1978, Ser. No. 869,225
Int. Cl.[2] E06C *9/00*; A47B *43/00, 83/00*
U.S. Cl. 182—91 **10 Claims**



1. A vanity storing step comprising a stair tread element, said tread element having a first lateral surface and a second lateral surface, at least one leg, said at least one leg having one end thereof fixedly secured to said first lateral surface, a pair of elongated arms, one end of each arm of said pair of elongated arms fixedly secured to said at least one leg, the longitudinal axes of said pair of elongated arms extending parallel to said first lateral surface and said second lateral surface and normal to said at least one leg, an elongated L-shaped structure, a pair of plates, said L-shaped structure having a first leg and a second leg, said pair of plates fixedly secured to said first leg and said second leg, said pair of plates being disposed in spaced apart parallel relationship, the other end of said each arm pivotably secured to said pair of plates along a common pivot axis whereby said pivot axis extends parallel to the longitudinal axis of said L-shaped structure, means to selectively locate said pivot axis along the lateral surfaces of said pair of plates.

4,135,605

WELDING LADDER WITH FOLDING AND SLIDING RUNGS

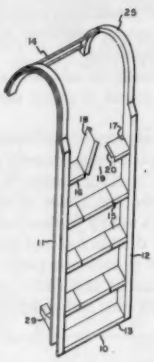
Michael M. Matherne, Rt. 1-Box 74, Des Allemands, La. 70030

Filed Aug. 1, 1977, Ser. No. 820,562
Int. Cl.[2] E06C *1/36, 1/38, 7/08*
U.S. Cl. 182—194 **4 Claims**

1. Welding ladder means comprising:

(a) elongated side rail means spaced apart essentially parallel and rigidly affixed to each other at opposite ends; and

(b) spaced apart rung means affixed to and oriented essentially perpendicular to said side rail means; said rung means being further defined as having a removable portion across its width which comprising an elongated member having a mid portion which is hindged at one end to the adjoing side portion of said rung means such that it can be swung upwards and back out of the horizontal plane defined by said rung means so as to allow free access



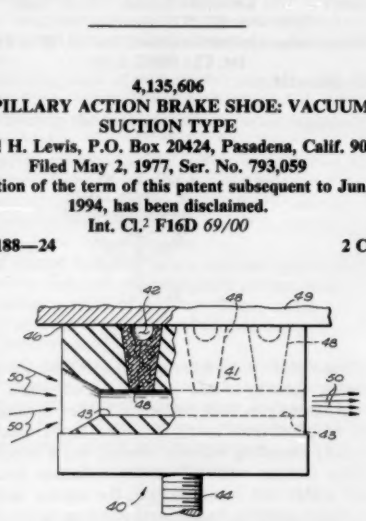
across said rung means, said mid portion resting upon the opposite side portion of said run when in a down position.

4,135,606

CAPILLARY ACTION BRAKE SHOE: VACUUM SUCTION TYPE

Nathanial H. Lewis, P.O. Box 20424, Pasadena, Calif. 90006

Filed May 2, 1977, Ser. No. 793,059
The portion of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] F16D *69/00*
U.S. Cl. 188—24 **2 Claims**



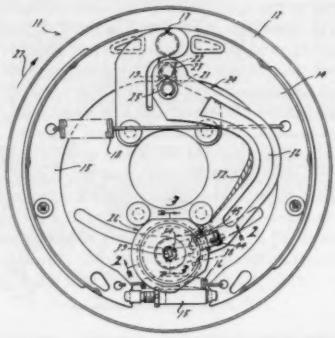
1. An improved brake block of the type for a rim brake assembly of a bicycle having a wheel rim, said brake block comprising an elongated body member of frictional material and having one face thereof with a plurality of porous inserts embedded therein, said porous inserts being made from an absorbent material having capillary action and frictional properties, said porous inserts having a first face thereof exposed on said face of said body member to contact said rim, said body member having a longitudinal hole extending therethrough from end to end thereof and being substantially parallel to said face of said body member, said porous inserts having a second face adjacent and communicating with said longitudinal hole, wherein the improvement comprises: said first face of said porous inserts having a cavity embedded therein and adjoining said first face; thereby upon movement of said bicycle and rotation of said wheel rim air is forced through said longitudinal hole causing a suction of air out of said cavity when said brake block is in contact with said rim, and creating a partial vacuum therein, this causing said brake block to be pressed tighter against said rim.

4,135,607

MAGNET SUPPORT FOR AN ELECTRIC BRAKE

Donald D. Brown, Thiensville, and Terry L. Trindle, Port Washington, both of Wis., assignors to Kelsey-Hayes Co., Romulus, Mich.

Filed Aug. 26, 1977, Ser. No. 827,886
Int. Cl.[2] F16D *65/34*
U.S. Cl. 188—161 9 Claims



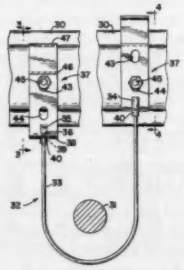
1. In an electrically actuated brake of the type having a pivotally supported lever adapted to operate the brake upon pivotal movement and an electromagnet including a housing carried by said lever and operable when actuated to pivot said lever, the improvement comprising an opening formed in said electromagnet, a projection formed on said lever extending through said magnet opening, said magnet opening and said lever projection providing a clearance therebetween for permitting limited transverse and pivotal movement therebetween without limiting the amount of rotation permitted by said electromagnet about said projection, said electromagnet housing having an integral projection extending toward said lever and adapted to cooperate with abutment means on said lever for allowing a limited relative rotation of said electromagnet about said lever projection and for transmitting actuating forces from said electromagnet to said lever.

4,135,608

ADJUSTABLE SUPPORT FOR BOTTOM BRAKE CONNECTING RODS FOR RAILWAY CARS

Franklin P. Adler, Michigan City, Ind., assignor to Illinois Railway Equipment Company, Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 832,287
Int. Cl.[2] B61H *16/38*
U.S. Cl. 188—210 14 Claims



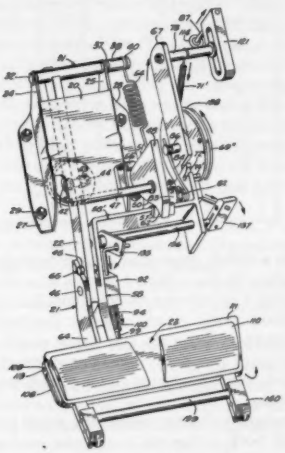
1. For combination with a railway car having spaced apart brake beams and a bottom connecting rod disposed on the underside thereof forming part of a brake rigging likely to become detached and drop to the road bed, means for preventing said bottom connecting rod from so dropping comprising: a flexible cable for underlying said bottom connecting rod with the ends extending upwardly, adjustable attachment pieces adapted to receive the upper ends of said flexible cable for securement at varying elevations to one of said brake beams and having offset portions at different elevations for overlying upwardly facing surfaces of said brake beam at correspondingly different elevations, and means for fastening said attachment pieces in different positions on said brake beam thereby adjusting the height of the lowermost portion of said cable.

4,135,609

BRAKE AND ACCELERATOR CONTROL FOR OPERATING A MOTOR DRIVEN VEHICLE

Arturo A. La Chiusa, Los Angeles, Calif., assignor to Auto-Safe Research and Development Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 303,517, Nov. 9, 1972, Pat. No. 3,944,012, and a continuation-in-part of Ser. No. 826,554, May 21, 1969, abandoned. This application Dec. 8, 1975, Ser. No. 638,823
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.[2] B60K *41/20*
U.S. Cl. 192—3 S 2 Claims



1. In brake and accelerator controls for operating a motor driven vehicle, said controls comprising:

a brake lever operably connected to the braking control means of said vehicle,

an accelerator control lever means pivotally mounted on said brake lever and selectively operable concurrently with said braking control means,

an interlocking mechanism mounted on said accelerator control lever means comprising:

connecting means releasably connecting a first end of said accelerator control lever means to the vehicle throttle means, and a movable member capable of causing said connecting means to release,

a foot pedal assembly mounted on a second end of said accelerator control lever means, comprising:

a bottom portion attached to said second end of said accelerator control lever means, a pedal portion pivotally connected to said bottom portion,

urging means causing said pedal portion to pivot away from said bottom portion, and a surface of said pedal portion upon which an operator may place a foot to overcome said urging means causing said pedal portion to pivot against said bottom portion.

a mechanical linkage between said pedal portion and said interlocking mechanism movable member such that said interlocking mechanism connecting means is caused to

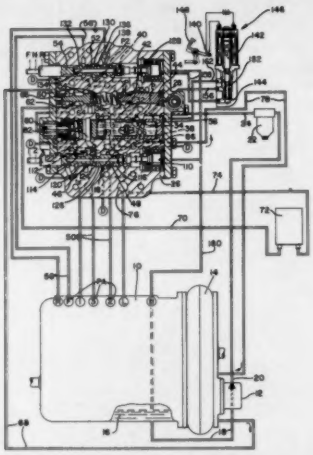
release only when said pedal portion is pivoted away from said bottom portion.

4,135,610

BRAKE OPERATED TRANSMISSION CLUTCHES WITH FULLY-RESETTING MODULATOR-LOAD-PISTON

Probir K. Chatterjea, Mount Prospect, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 7, 1976, Ser. No. 693,469
Int. Cl.[2] B60K *29/00*
U.S. Cl. 192—4 A **4 Claims**



1. For use in a clutch controlled vehicle having activatable brake apply means for the vehicle brakes, a rate of rise hydraulic system having a connection to individual lines of a piston-type, transmission-clutch group, wherein the fluid output of the system undergoes pressure loss to an actual clutch fill pressure in order to pass from said connection through said individual lines to reach a selected clutch piston, said hydraulic system comprising:

a clutch pressure modulating valve and signal pressure control means both reciprocally mounted and in opposite ends of a bore formed by a valve housing, said clutch pressure modulating valve being arranged to afford flow of the system fluid output to said connection, out of pumped fluid supplied thereto from a pump source;

said signal pressure control means comprising a dump valve member reciprocable toward and away from the adjacent end of the bore, and a differential pressure chamber defined between and by the dump valve member and said bore end and receiving system-output-fluid from said connection;

said dump valve member cooperating with modulator loading means in said bore to define a signal pressure chamber, and said dump valve member providing a fluid output;

means of connection from the dump valve member utilizing said dump valve fluid output to supply rising signal fluid pressure to the fluid inside the signal pressure chamber; and

neutralizer means and a selector valve member disposed in series in said housing in that order at said connection;

said neutralizer means delivering system fluid output to the selector valve member and responsive to activation of said vehicle brake apply means to withhold system fluid output from the selector valve member;

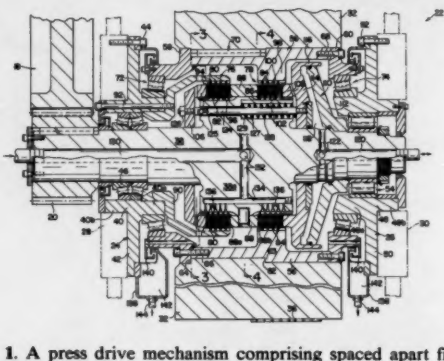
said selector valve member having spool valve portions effective in progressive selector valve positions for cooperating with said individual lines to direct, to selected ones of the clutch pistons, the system fluid output delivered by said neutralizer means.

4,135,611

PRESS DRIVE CLUTCH WITH BRAKE

Edwin A. Spanke, Oak Forest, Ill., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jan. 14, 1977, Ser. No. 764,223
Int. Cl.[2] F16D *67/04*
U.S. Cl. 192—18 A **14 Claims**



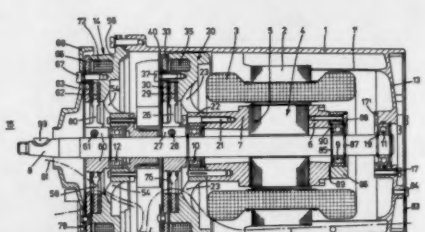
1. A press drive mechanism comprising spaced apart first and second fixed support means having axially aligned openings therethrough, an output shaft having axially opposite ends each rotatably supported in a corresponding one of said openings, flywheel means surrounding said output shaft and having axially opposite ends each rotatably supported by a corresponding one of said support means independent of said output shaft, clutch means radially between said output shaft and flywheel means and including clutch disc means cooperatively supported relative to said flywheel means and output shaft, brake means radially between said output shaft and flywheel means and including brake disc means cooperatively supported relative to said output shaft and said fixed support means, and clutch and brake actuating means for alternately engaging and disengaging said clutch means and brake means.

4,135,612

ELECTRIC MOTOR WITH AIR COOLED CLUTCH AND BRAKE

Karl Lengsfeld, Plankstadt, Germany, assignor to Frankl & Kirchner GmbH & Co., KG, Schwetzingen, Germany

Filed Nov. 4, 1976, Ser. No. 738,966
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1975, 2549545
Int. Cl.[2] F16D *67/06*
U.S. Cl. 192—18 B **8 Claims**



1. In an electrical motor control and variable speed drive which includes a motor housing, a constantly driven rotor nonrotatably connected to a disk flywheel which forms a portion of a rotating unit and an intermittently driven shaft, and nonrotatably supporting a clutch disk and a brake disk, means securing a central portion of each said disk to said shaft,

the clutch disk being coupled with a frictional surface on a magnetic armature disk which is axially displaceable and is mounted on the flywheel disk, when a given clutch winding is energized, the brake disk being coupled with a frictional surface of an axially displaceable brake armature disk disposed in the motor housing, when a given brake winding disposed in a stationary brake bearing plate forming a portion of a stationary unit is energized, the improvement wherein said clutch winding is disposed in said disk flywheel for rotation with said disk flywheel; said clutch and said brake disk each have two flat side surfaces and are each provided on both of said flat side surfaces with respective frictional linings; said clutch disk is disposed between said magnetic armature disk and one of said frictional surfaces on said disk flywheel; and said brake disk is disposed between said brake armature disk and one of said frictional surfaces on said brake bearing plate; whereby when the clutch winding is energized the clutch disk, the brake disk and the intermittently driven shaft are directly coupled to the rotating unit which includes said disk flywheel, and when said brake winding is energized, the clutch disk, the brake disk and the intermittently driven shaft are directly coupled to the stationary unit which includes the bearing plate.

4,135,613

RECORD KEEPING TICKET ISSUING MACHINE

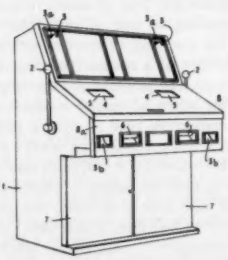
Marquis A. Jackson, 60 Martin Pl., Sydney, New South Wales, Australia (2000)

Filed Jan. 11, 1977, Ser. No. 758,485

Claims priority, application Australia, Sep. 27, 1976, 18136/76

Int. Cl.² G07F *11/26*

U.S. Cl. 194—2 **5 Claims**



1. A coin controlled and record keeping ticket issuing machine comprising a housing in which there is a coin credit establishing means, an electrically initiated mechanical catch means activated by the establishment of the coin credit to release a counterweighted slide thereby allowing the slide to move under the influence of its counterweight from its normal position covering a support surface for tickets to be written on to a position exposing said support surface, said slide in moving from its normal position creating power circuits for feed means and ticket severing means to be subsequently energized, manual means on the housing to return the slide to its normal position and to re-engage said catch means, first control means activated by the return of the slide to its normal position to temporarily activate said feed means to advance a strip laminate of original and duplicate tickets in order to locate a new ticket with duplicate over said support surface and locate the preceding now written on original ticket in operative relationship to a ticket severing and issuing means, second control means activated by the completion of the ticket advancing operation of the feed means to sever and issue said preceding original ticket and third control means activated by slack in the advancing strip of duplicate tickets to temporarily activate a duplicate ticket storage means.

4,135,614

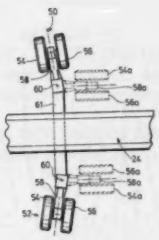
PORTABLE RADIAL STACKER

Lou F. Penterman, Milliken, and Harry Geverink, Markham, both of Canada, assignors to Assinck Bros. Limited, Markham, Canada

Filed Apr. 15, 1977, Ser. No. 787,876

Int. Cl.² B65G *41/00*

U.S. Cl. 198—306 **7 Claims**



1. In a portable radial stacker for stockpiling a material including a conveying means adapted to convey said material from a material loading position to a material unloading position, a support means adapted to support said conveying means at an upwardly inclined angle during the stockpiling stage and in the horizontal position during the transporting stage, and an axle assembly adapted to support one end of the support means on the ground and to move said radial stacker in an arc about the material loading position, said axle assembly also adapted to support and move said stacker during the transporting stage from one place to another place, said axle assembly comprising:

(a) a transverse member secured to the end of the support means proximate the ground and aligned transverse to the direction of the conveying means;

(b) two pairs of tires, each pair of tires having an axle bar therebetween and each pair of tires consisting of two coaxial tires;

(c) two torsion levers, one end of each torsion lever secured to the central portion of the axle bar between each pair of tires and the opposite end of each torsion lever pivotally connected to one end of said transverse member,

wherein each tire has an independent suspension mounting on each respective end of each axle bar, and

(d) at least one drive means adapted to drive at least one pair of said two pairs of tires.

4,135,615

TOBACCO FEEDING SYSTEM

Warren A. Brackmann, Cooksville, and Karel Hrboticky, Etobicoke, both of Canada, assignors to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Filed Oct. 14, 1976, Ser. No. 732,382

Claims priority, application United Kingdom, Oct. 16, 1975, 42574/75

Int. Cl.² B65G *37/00*

U.S. Cl. 198—371 **7 Claims**

1. An apparatus for feeding of tobacco from a source thereof to a plurality of individual cigarette-making machine feeds, which comprises:

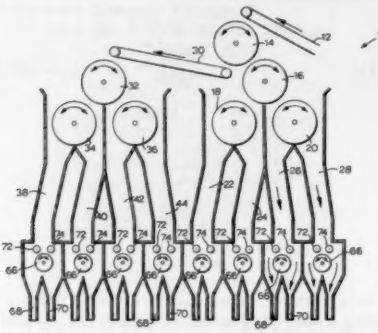
a plurality of upwardly projecting reservoirs open at the top and bottom thereof and having enclosing side walls,

tobacco metering means located at the lower end of each of said reservoirs for metering tobacco from said reservoir to one or a selected one of two of said individual feeds, and

distribution means located between the downstream end of a conveyor means extending from said source and the upper end of said reservoirs for feeding all the tobacco fed to the apparatus by said conveyor means to one or another of said reservoirs,

said metering means comprising first and second rollers

mounted for rotation about parallel horizontal axes in opposite directions to direct tobacco downwardly between their opposed surfaces, each of said first and second rollers having a plurality of radially projecting pins located in arcuately spaced rows, and a third roller mounted below said first and second rollers for rotation in either



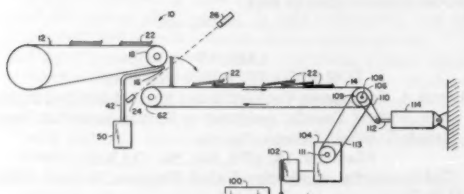
direction about a horizontal axis parallel to the axes of the first and second rollers, the third roller having a plurality of radially-projecting pins located in arcuately spaced rows, the axis of the third roller lying on a straight line perpendicular to the line joining the axes of the first and second rollers.

4,135,616

METHOD AND APPARATUS FOR STACKING PASTA STRIPS

Roy C. Pellaton, Stockton, Calif., assignor to Guntert & Pellaton, Inc., Stockton and American Beauty Macaroni Company, Fresno, both of, Calif.

Filed May 6, 1977, Ser. No. 794,439
Int. Cl.[2] B65G *57/08, 57/18*
U.S. Cl. 198—423 **7 Claims**



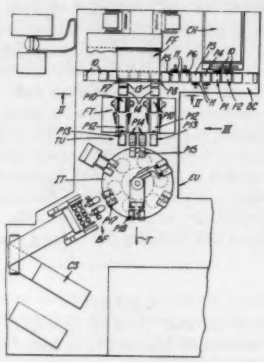
1. A method for stacking pasta strips for subsequent packaging comprising: conveying substantially dry pasta strips as a stack of at least one strip in a sequential manner along a first conveyor belt; discharging each said stack sequentially from said first belt to a second relatively lower conveyor belt in a manner tending to flip said stack trailing side forward; directing a stream of air substantially only at the moment said leading side of said stack encounters said second belt and in a downstream direction from between said first and second belts across the path of said stack to assist to flip said stack forward; retarding the translation of said second conveyor belt relative to the first conveyor belt to permit the sequential overlapping of stacks; and separating a preselected count of stacks on said second belt as a bundle.

4,135,617

ARTICLE CONVEYING MECHANISMS

Robert W. Davies, and Leonard R. Wager, both of London, England, assignors to Molins Limited, London, England

Division of Ser. No. 522,798, Nov. 11, 1974, Pat. No. 4,019,413.
This application Feb. 23, 1977, Ser. No. 771,297
Claims priority, application United Kingdom, Nov. 15, 1973, 53158/73
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—458 **6 Claims**



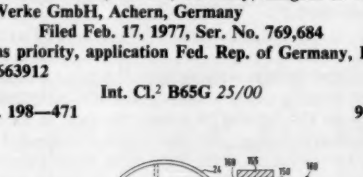
1. Apparatus for conveying cuboid articles such as bundles of cigarettes from two parallel rows of said articles, comprising a pair of rotors rotatable about axes parallel to said rows, each rotor being associated with one of said rows, a plurality of article holders mounted at regular intervals around each rotor, drive means to index said pair of rotors in opposite directions in steps corresponding to one of said intervals, means at a loading position for inserting a foremost article from each row onto an article holder of a respective rotor when stationary, and means at a discharge position for ejecting an article from each article holder when advanced a whole number of steps away from the respective row so that a pair of articles are ejected which are aligned but spaced apart a distance different than the spacing between said rows, each said rotor comprising a planetary gear system including a planet gear rigidly connected to each of said article holders, the gear ratios of said planetary gear system being such that said planet gears rotate bodily without change of orientation, whereby said article holders and said articles contained therein maintain the same orientation during movement of said rotor.

4,135,618

CONVEYING APPARATUS

Gustav Kuckhermann, Achern, Germany, assignor to Wilhelmstal-Werke GmbH, Achern, Germany

Filed Feb. 17, 1977, Ser. No. 769,684
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2663912
Int. Cl.[2] B65G *25/00*
U.S. Cl. 198—471 **9 Claims**



1. Conveying apparatus, comprising at least one rotatable disc, feed means for conveying transported material substan-

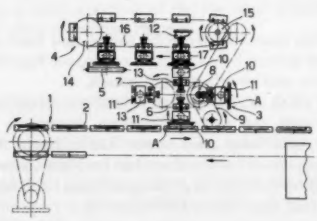
tially tangentially towards said disc, at least one removal means for conveying the transported material away from said disc, a parallel collector arranged between said disc and said removal means, said parallel collector comprising at least two grab means, each grab means comprising an upper gripping member and a lower gripping member coplanar with said disc, grab shifts about which said grab means are swivelable, said grab shafts being orientated substantially parallel to the axis of rotation of said disc and drive means for swivelling said grab means about said shafts in synchronization between a first position in which the grab means receive an article from said disc and a second position in which the grab means delivers said article to the removal means.

4,135,619

APPARATUS FOR TRANSFERRING CONFECTIONERY PRODUCTS FROM A FEEDING CONVEYOR TO A RECEIVING CONVEYOR

Renzo Cerboni, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed May 9, 1977, Ser. No. 794,831
Claims priority, application Italy, Jun. 11, 1976, 24170 A/76
Int. Cl.[2] B65G *47/52*
U.S. Cl. 198—477 **3 Claims**



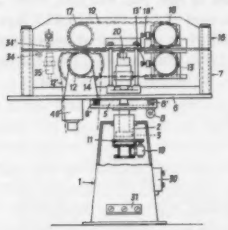
1. An apparatus for transferring products particularly in a wrapping machine, comprising a feeding conveyor carrying said products along a rectilinear horizontal path, a receiving conveyor arranged downstream of said feeding conveyor, a first transfer conveyor arranged above said feeding conveyor and having a first and a second rectilinear path portion parallel to said rectilinear path of said feeding conveyor, said second rectilinear path portion being arranged above said first rectilinear path portion and said first transfer conveyor being movable in the same direction as said feeding conveyor along said first rectilinear path portion and in a direction opposite thereto along said second rectilinear path portion, a second transfer conveyor arranged above said first transverse conveyor and having a first rectilinear path portion above said second rectilinear path portion of said first transfer conveyor and a second rectilinear path portion above said receiving conveyor, said second transfer conveyor being movable along said first rectilinear path portion thereof in the same direction as said first transfer conveyor along said first rectilinear path portion thereof, prehensile elements carried by said first and second transfer conveyors for mutual cooperation, each of said prehensile elements being movable along a closed path and comprising suckers on the side lying outwardly of said closed path, said prehensile elements carried by said first transfer conveyor being rotated through 180° when passing from said first to said second rectilinear path portion of said first transfer conveyor, means for lowering said prehensile elements when they move along said first rectilinear path portions of said transfer conveyors to cause the corresponding suckers carried by said first transfer conveyor to come into contact with corresponding of said products carried by said feeding conveyor and the corresponding suckers carried by said second transfer conveyor to come into contact with respective of said products supported by corresponding upwardly directed suckers of said prehensile elements movable along said second rectilinear path portion of said first transfer conveyor, and means for providing a vacuum in said suckers when said prehensile elements travel from said first to said second rectilinear path portions of said transfer conveyors to cause the corresponding suckers to take up and transfer the products contacted thereby.

4,135,620

ADJUSTABLE CONVEYING DEVICE

Siegfried Harcuba, Innsbruck, Austria, and Ewald Dussa, Schmelz, Germany, assignors to Compriforce AG, Chur, Switzerland

Filed Jun. 9, 1977, Ser. No. 805,169
Claims priority, application Austria, Jun. 11, 1976, 4249/76
Int. Cl.[2] B65G *21/10*
U.S. Cl. 198—836 **10 Claims**



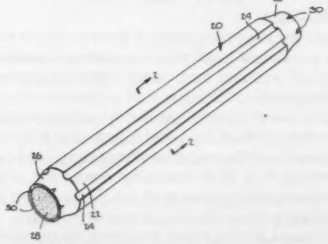
1. A device for conveying of materials comprising a conveyor belt which loops around at least two rollers and a holding down means for pressing the materials on the conveyor belt, the improvement comprising wherein the conveyor belt and the holding-down means are supported by a carriage, first means for coupling said conveyor belt and said holding-down means to one another to adjust the distance between the conveyor belt and the holding-down means, a lifting means for adjusting the height of the carriage, the conveyor belt and the holding-down means, a turning means for pivoting the carriage, the conveyor belt and the holding-down means about an axis perpendicular to the plane of the conveyor belt and means to transversely adjust the position of the carriage, the conveyor belt and the holding-down means with respect to the conveying direction of the conveyor belt.

4,135,621

HYDROGEN STORAGE MODULE

Pierre P. Turillon, Ramsey, and Gary D. Sandrock, Ringwood, both of N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 24, 1978, Ser. No. 881,034
Int. Cl.[2] B65D *25/00;* F17C *11/00;* C01B *1/26;* F16L *55/04*
U.S. Cl. 206—0.7 **4 Claims**



1. A hydrogen storage module adapted to be employed in

plurality inside a pressure containment means to store hydrogen as metallic hydride comprising

(A) A fluted tube section of metal having good thermal conductivity, said section having a low length to diameter ratio, crimped closed at each end over the periphery of

(B) a microporous filter disc,

(C) the metal crimped over said periphery of said microporous filter disc having depressed, generally radially extending paths therein and

(D) said fluted tube section being filled by said metal of said metal hydride to an extent of no greater than 78% of the volume of the tube section when the metal of the hydride is in a hydrogen-free condition.

4,135,622

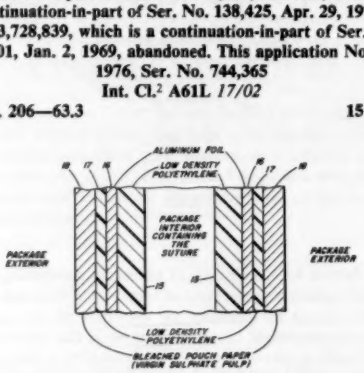
PACKAGED, DESICCATED SURGICAL ELEMENTS

Arthur Glick, New Milford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 345,633, Mar. 28, 1973, which is a continuation-in-part of Ser. No. 138,425, Apr. 29, 1971, Pat. No. 3,728,839, which is a continuation-in-part of Ser. No. 788,501, Jan. 2, 1969, abandoned. This application Nov. 23, 1976, Ser. No. 744,365

Int. Cl.[2] A61L *17/02*

U.S. Cl. 206—63.3 **15 Claims**



1. A package comprising an air-tight sealed container fabricated from a material which is substantially impervious to water vapor, said container having therein a storage stable sterile synthetic surgical element of a polymer subject to hydrolytic degradation to non-toxic, tissue-compatible absorbable components, said polymer having glycolic acid ester linkage, said storage stable sterile synthetic surgical element further characterized in that the absorbed water moisture in the sterile surgical element (in the sterile enclosure is less than 0.5% by weight of the sterile surgical element) is at or less than 0.25% by weight of the sterile surgical element, in the sterile enclosure.

4,135,623

PACKAGE FOR ARMED SUTURES

Eberhard H. Thyen, Middlesex, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jan. 20, 1978, Ser. No. 871,047

Int. Cl.[2] A61L *17/02*

U.S. Cl. 206—63.3 **14 Claims**

1. A suture package comprising a front panel, an inner panel, and a back panel, said inner panel extending beyond the top of said front panel and said back panel extending beyond the top of said inner panel,

said inner panel having suture mounting means affixed across the width of the panel intermediate the top of said inner panel and the top of said front panel, and having first and second fold lines extending across the width of the panel immediately above said needle mounting means and immediately above the top of said front panel,

said back panel having suture mounting means affixed across the width of the panel intermediate the top of said back panel and the top of the suture mounting means on said inner panel, and having first and second fold lines extending across the width of said panel immediately above said needle mounting means and a spaced distance below said needle mounting means corresponding to the distance between the first and second fold lines of said inner panel,

at least one armed suture mounted on at least one of said inner and back panels with the needled end of said armed suture secured in the suture mounting means and the bulk of said suture strand enclosed between two panels of the package, and

a cover flap extending from the top of said back panel and attached thereto by a fold line, said cover flap being foldable over said inner and back panels,

whereby, when said cover flap is folded over said inner and back panels the suture mounting means are enclosed thereby, and when said cover flap is open, the suture mounting means on said inner and back panels are exposed and may be elevated by folding said inner and back panels on the fold lines above and below their respective suture mounting means to provide a double tier of needled sutures for removal from the package.

4,135,624

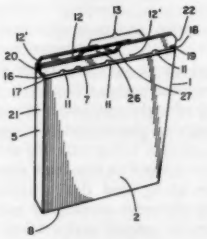
PLASTIC FILE SLEEVE AND INDEX CARDS

Jack A. Rardin, and Gregory A. James, both of 617 18th St., Charleston, Ill. 61920

Continuation of Ser. No. 738,648, Nov. 4, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,577

Int. Cl.[2] B65D *85/00*

U.S. Cl. 206—425 **8 Claims**



1. A sleeve file case and card set, comprising a tubular member, said tubular member including a central cavity therethrough which opens to both opposite ends of said tubular member, a plurality of cards slidably positioned in said cavity being slidably removable therefrom, each of said cards including a body portion having a transverse dimension corresponding to that of said central cavity for insertion of said body portion in said cavity, each of said cards being in substantially full frictional engagement with at least one other of said cards, wherein said tubular member is rectangular in cross-section

having the same cross-sectional dimension and configuration for one end of said tubular member to the other, a first relatively wide end wall, a second relatively wide end wall spaced apart from said first end wall to define said central cavity between said end walls, a top edge of said end walls bordering the opening of said cavity at one end thereof, a bottom edge of said end walls bordering the opening of said cavity at the opposite end thereof, and a plurality of longitudinal ribs formed on the inner surfaces of said end walls projecting into said cavity to contact an adjacent one of said cards and space said cards from said inner surfaces of said end walls, said plurality of ribs on each end wall being spaced apart a first distance to reduce friction between said cards and said end walls when said cards are tightly packed in said cavity, said first distance being greater than the cross-sectional dimension of one of said ribs, each of said ribs extending from one end of said tubular member to the other and each of said ribs having the same cross-sectional configuration and dimension continuously from one end of said tubular member to the other wherein said plurality of cards includes a first card, said first card includes a main body portion having a width less than the width of said cavity of said tubular member, a top border portion having a width greater than the width of said cavity, said means to retain said cards in position in said cavity including an overhang portion of said top border portion which exceeds the width of said cavity, and extends laterally beyond said cavity and across at least a portion of the top edge of said side walls when said card is inserted therein.

4,135,625

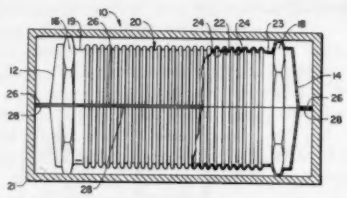
MULTI-COMPARTMENT CONTAINER FOR FRAGILE DISKS

Kenneth V. Merrill, 617 Crescent Ave., San Mateo, Calif. 94402

Continuation-in-part of Ser. No. 704,136, Jul. 12, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,959

Int. Cl.[2] B65D *85/30*

U.S. Cl. 206—445 **6 Claims**



1. A multi-compartment container receivable within a relatively rigid outer protective package comprising:

a cylindrical hollow bellows section formed of a resilient plastic sheet, said bellows section having a diameter less than a minimum lateral diameter of said outer package, said section having on an inner surface thereof a plurality of alternate angular parallel grooves and ridges cooperating to define a plurality of compartments;

A pair of end spacer sections disposed at respective ends of and integral with said bellows section; and

rib means transverse of said grooves and ridges beetween the respective ends of an integral with said grooves and ridges,

said end spacer sections including an exterior ridge and adjacent groove portion for receiving a rubber band,

said exterior ridge including an indentation adapted to permit the insertion of a finger for expediting the release of the rubber band from said exterior groove,

said end sections being of a diameter greater than the diameter of said bellows section and adapted to abut the inner walls of said outer package to suspend said bellows section between said end spacers sections in said outer package spaced therefrom the protecting fragile disks contained in said container.

4,135,626

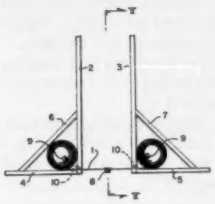
CONSTANT FORCE SPRING EXPANDABLE CLASP-HOLDER

Robert N. Cawood, c/o Tippy Tam Inc., 1299 Rodi Rd., Turtle Creek, Pa. 15145

Filed Sep. 17, 1976, Ser. No. 724,342

Int. Cl.[2] A47F *7/00*

U.S. Cl. 211—43 **2 Claims**



1. A holding device comprising a constant force spring coiled at opposite ends to form two free coils, left and right plates interposed between the coiled ends of said spring and freely movable along said spring in opposite directions from a point intermediate the opposite ends of said spring with said left and right hand plates in direct abutment with one another to a point adjacent said ends of said spring, and normally urged toward one another by said coiled ends, base means attached to each plate in a manner permitting the spring to pass through the joint between each plate and its base whereby said left and right plates are held generally in parallel relationship transverse to the portion of said spring which passes between them, a stop attached to the center of said spring and said base means containing indentations to accommodate said stop in a manner permitting said device to close with no gap between said left and right plates.

4,135,627

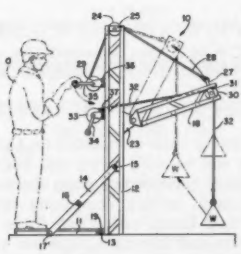
OPERATOR BALANCED, MANUALLY POWERED CRANE

James McInerney, 735 Cedarville Rd., Easton, Pa. 18042

Filed Nov. 4, 1976, Ser. No. 738,894

Int. Cl.[2] B66C *23/00*

U.S. Cl. 212—8 R **1 Claim**



1. A hoisting apparatus comprising:

a vertical supporting frame,

a rearwardly extending base adapted for having an operator standing thereon providing a counter-balance to the weight to be lifted, said base being pivotably connected at the lower end of said frame and capable of closing on said frame,

foldable brace means attached at one end to said frame and at the other end to said base so as to lock said base into a supporting position and unlock said base to be pivoted to said closed position against said frame,

a pair of forwardly projecting brackets mounted on said frame,

a forwardly extending boom pivotably attached to said pair of forwardly projecting brackets, said boom being upwardly folding,

first pulley means mounted on the upper end of said frame,

a second pulley means mounted at the end of said boom,

a pair of brackets having a mounting base receiving means, said brackets being fixed to the rearward portion of said frame,

first and second winding mechanisms each having a mounting base constructed for slidably engaging said mounting base receiving means of said brackets,

a first cable passing from said first winding mechanism over said first pulley means to said boom for raising and lowering said boom, and

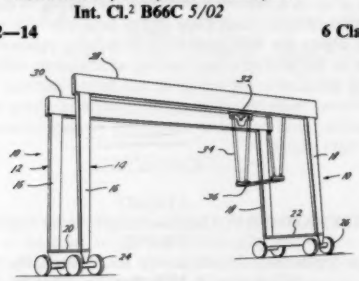
a second cable passing from said second mechanism over said second pulley for attachment to a load, whereby operation of said second winding mechanism raises and lowers the load.

4,135,628

HOISTING APPARATUS WITH IMPROVED ANTI-SWAY SYSTEM

Rudy M. Harris, Hallsville; Roger L. Wolfe, and William T. Martin, both of Longview, all of Tex., assignors to Marathon LeTourneau Company, Longview, Tex.

Continuation-in-part of Ser. No. 731,585, Nov. 12, 1976, abandoned.
Filed Mar. 20, 1978, Ser. No. 890,596
Int. Cl.[2] B66C 5/02
U.S. Cl. 212—14 **6 Claims**



1. A hoisting apparatus comprising

a supporting structure having a substantially horizontal beam and means for supporting the beam in such horizontal position,

a lifting frame having means for releasably engaging loads to be moved,

a pair of spaced apart lifting frame sheaves supported on said lifting frame,

a pair of spaced apart beam sheaves supported from said beam,

a plurality of trolley sheaves mounted on a trolley which is mounted on and movable along said beam, said trolley being positioned between said beam sheaves,

a continuous cable reeving connecting said drum, said sheaves on said beam, said lifting frame sheaves, said trolley sheaves and forming a crossover portion of said continuous cable between said trolley sheaves whereby rotation of said drum in one direction raises said lifting frame and rotation of said drum in said opposite direction lowers said lifting frame,

a plurality of braked sheaves engaging said crossover portion of said continuous cable to retard movement of said crossover portion of said continuous cable,

separate and independent brake means for each of said braked sheaves to provide either a zero retarding force or a retarding force of a preselected valve to each of said braked sheaves, and

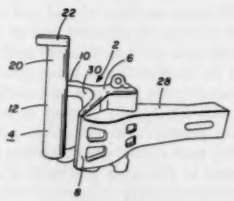
control means to selectively actuate any combination of said brake means such that a combined zero force or any combination of said retarding forces is applied to said braking sheaves.

4,135,629

COUPLER KNUCKLE WITH SAFETY SHELF

Walter C. Dilg, Elma, and Albert E. Martin, Lancaster, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 29, 1977, Ser. No. 792,160
Int. Cl.[2] B61G 3/00
U.S. Cl. 213—153 **6 Claims**



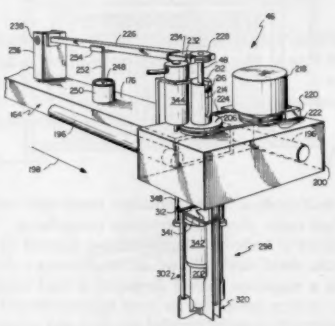
4. A railway car coupler knuckle having a forward nose and a rearward tail, said forward nose having an outer buffing face and an inner pulling face, the improvement comprising said forward nose having a vertical upward extension terminating in a shelf which laterally extends over the buffing face of the nose, the pulling face of the extension being inclined forwardly toward the buffing face to permit vertical angling of the coupler.

4,135,630

CENTERING DEVICE FOR AUTOMATIC PLACEMENT OF CHIP COMPONENTS IN HYBRID CIRCUITS

Michael D. Snyder, Chenango Bridge, and Erwin F. Bates, Binghamton, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Dec. 8, 1977, Ser. No. 858,544
Int. Cl.[2] H01L 21/58, 21/96
U.S. Cl. 214—1 BT **11 Claims**



1. A centering device for centering an attached component chip on the spindle of a substrate assembly apparatus, comprising:

a spindle having a tip at one extremity suited for attachment and holding thereto of said component chip;

a spindle housing enclosing and aligned with said spindle, said spindle tip extended beyond said spindle housing;

means for centering said component chip on said spindle tip, said means for centering being withdrawn from said spindle tip during the process of attachment of said component chip, said means for centering acting on said component chip after attachment, said means for centering including:

a pair of opposed first axis locators pivotably and concentrically suspended at one end from said spindle housing, the

other end of said first axis locators being adjacent to said spindle tip;

a pair of opposed second axis locators pivotably and concentrically suspended at said one end from said spindle housing, the other end of said second axis locators being adjacent to said spindle tip, the axes for pivoting of said first axis locators being perpendicular to the axes for pivoting of said second axis locators;

means to pivot said first and second axis locators, whereby when pivoted inwardly toward said spindle, said other ends of said axis locators adjacent to said spindle tip contact said attached component chip, pushing said chip into concentricity with said spindle and said spindle housing;

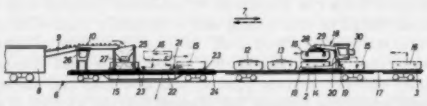
whereby said component chip need not be centered relative to said spindle tip at the moment of attachment and imprecise storage of said component chip is permitted.

4,135,631

FREIGHT TRAIN

Josef Theurer, Vienna, and Friedrich Öllerer, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 28, 1977, Ser. No. 781,639
Claims priority, application Austria, May 31, 1977, 3986/77
Int. Cl.[2] B65G 67/08
U.S. Cl. 214—38 CA **6 Claims**



1. A train of railroad cars for receiving, transporting and discharging bulk material, comprising

(a) a succession of cars each having a loading platform coupled together for movement along a track,

(b) a plurality of transport containers for the bulk material arranged on each of the loading platforms in succession in the direction of the track,

(1) the successive loading platforms of the cars of the train defining a path for movement of the transport containers in the track direction,

(c) a mobile gantry crane including a device for gripping, lifting and holding a respective one of the transport containers,

(d) a continuous track means on the successive loading platforms and extending along the train in said direction laterally of the containers, the transport containers being arranged between the track means, the mobile crane being mounted on the track means for movement therealong and being adapted to grip respective ones of the transport containers and continuously to drive the gripped containers selectively along said path to and from a loading and a storage station on respective ones of the cars of the train, whereby successive ones of the containers may be loaded with the bulk material and the loaded containers may be stored on the platform of the cars, an end one of the cars comprising the loading station for successive ones of the transport containers,

(e) a charging device for transporting bulk material to the loading station, and

(f) a storage container arranged at the loading station to receive the bulk material from the charging device and to discharge the stored bulk material from the storage container to the transport container at the loading station.

4,135,632

LOAD INDICATORS FOR CONSTRUCTION VEHICLES

James A. Berkel, Jr., Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1977, Ser. No. 791,904
Int. Cl.[2] E02F 9/26
U.S. Cl. 214—761 **16 Claims**

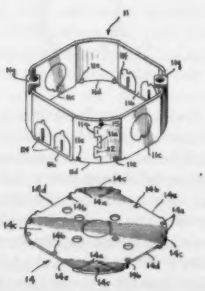
1. In a construction vehicle of the type having a member movably mounted thereon, at least one fluid actuating cylinder operatively connected to said member for moving it between lowered and raised positions, a work tool mounted on said member and indicating means for indicating the mode imposed on said member by said work tool, the invention wherein said indicating means comprises valve means operatively connected to said cylinder for receiving pressurized fluid therefrom to provide a pressure signal and signal means operatively connected to said valve means for receiving said pressure signal therefrom upon opening of said valve means, and control means responsive to movements of said member for sequentially (1) initially applying a predetermined closing force to said valve means when said member is in its lowered position, (2) permitting said valve means to open to communicate said pressure signal at a level determined by said load to said signal means when said member is moved to a predetermined height between its lowered and raised positions, and (3) maintaining said valve means in its same open condition to continue communication of the same level of said pressure signal to said signal means when said member is further moved towards its raised position, so that said signal means shows a generally constant load when said member is above said predetermined height.

4,135,633

ELECTRICAL JUNCTION AND OUTLET BOX

Alan C. Lockwood, Rosemead, and Glenn A. Stock, Alhambra, both of Calif., assignors to Norris Industries, Inc., Los Angeles, Calif.

Filed Oct. 31, 1977, Ser. No. 846,676
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.94 **5 Claims**



1. An electrical junction and outlet box comprising:

a side wall formed from an elongated flat strip bent into a predetermined geometric shape, the opposite ends of said side wall being joined together, said side wall having a plurality of lip portions formed along the bottom edge thereof, said lip portions being co-planar with the side wall portions in which they are formed and elongated and narrow relative to the height of said side wall, said lip portions further having longitudinal substantially uniplanar edges and being spaced around said bottom edge and separated from each other by indented portions having substantially uniplanar edges lying in a plane parallel to the plane of the lip portion edges, and

a flat bottom plate welded to said side wall and having substantially the same geometric shape as said side wall, said bottom plate having a plurality of lip portions which are narrow relative to the width of said bottom plate and which lie in the same plane as the remainder of said bottom plate, said bottom plate lip portions being separated from each other by indented portions formed along the edge thereof, the lip portions of said bottom plate being fitted within the indented portions of said side wall and the lip portions of said side wall being fitted within the indented portions of said bottom plate to form a substantially uniplanar bottom for said box, the edges of which are contiguous with said side wall, upward projections being formed on the lip portions of said bottom plate and indentations being formed on the indented portions of said side wall, each projection of said bottom plate being positioned opposite a corresponding indentation on said side wall, a weld joint being made between the bottom plate and the side wall at each of said pairs of corresponding projections and indentations, said bottom plate having locator projections along the edges of the inner surfaces of the indented portions thereof, the edges of said locator projections abutting against the sides of the lip portions of said side wall and thereby facilitating the location of said bottom plate against the bottom edge of said side wall with said corresponding projections and indentations in abutment against each other during welding.

4,135,634

CONTAINER OR LIKE STRUCTURE

Lance C. Frye, R.R. 4, Davenport, Iowa 52800

Filed May 24, 1976, Ser. No. 689,057

Int. Cl.[2] B65D *7/04;* **A63C** *19/10;* **F25D** *1/00*

U.S. Cl. 220—5 A **10 Claims**

9. The combination of a length of tubing of relatively thin-walled substantially non-crushable material of circular cross-section having uniform annular corrugations, a sheet of thin, relatively pliable material at least partly embracing the tubing, and a clamp collar of like corrugated tubing having a lengthwise wall section cut away to give the collar a C-shaped section and providing a lengthwise gap, said collar material being such as to enable the collar to be spread apart enough to enable the gap to widen and thus slip over and embrace the sheet edge and tubing and to spring back to shape for tightly clamping the sheet edge and tube, the two sets of corrugations intermeshing and deforming the sheet edge between them.

4,135,635

DUAL-PART CAP ASSEMBLY FOR SEALED FLUID RESERVOIRS

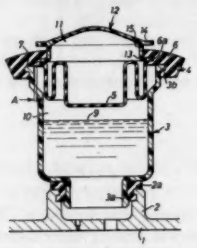
Takashi Fujii; Hiroyuki Nakamura, and Teruo Souma, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 750,425, Dec. 14, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,480

Claims priority, application Japan, Dec. 23, 1975, 50-154208

Int. Cl.[2] B65D *41/16, 51/16;* **B60T** *11/26*

U.S. Cl. 220—85 B **5 Claims**



1. A seal cap assembly for a reservoir casing for a hydraulic brake master cylinder, the casing having an annular stepped flange at the outside of the upper opening thereof, said seal cap comprising a first cap made of synthetic rubber and including an annular thick rim portion to be resiliently coupled over the stepped flange of said casing and a vertically expansible diaphragm integrally formed with the inner periphery of the rim portion, the rim portion having at the inside wall thereof a radially opening annular groove; and a second cap having a radially extending annular rim pressed into the groove of said cap to form an air chamber above the diaphragm and a vent hole to connect the air chamber to the surrounding air; whereby when the thick rim portion of said first cap is secured over the stepped flange of said casing, the inner circumferential flat wall of the rim portion engages an upper annular surface of the stepped flange to air-tightly seal brake fluid in said casing by the diaphragm of said first cap.

4,135,636

OUTLET PIPE CLOSURE FOR LIQUID CONTAINERS

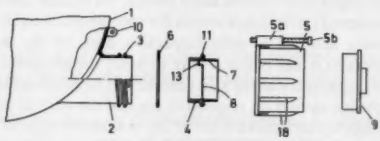
Michael Rudbach, Dierdorf-Wienau, Germany, assignor to Udo Schutz KG, Selters, Germany

Filed May 12, 1977, Ser. No. 796,186

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 7615545[U]; Dec. 16, 1976, 2657009

Int. Cl.[2] B65D *41/20*

U.S. Cl. 220—265 **3 Claims**



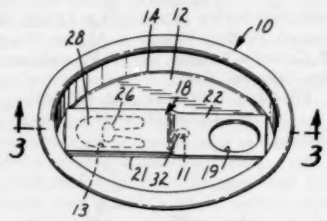
1. A container for liquid having an outlet pipe, a cap screw which is screw-threadedly received on said outlet pipe, a closure element disposed between said outlet pipe and said cap screw and having a passageway therethrough closed by an integral sealing diaphragm, and a sleeve for receiving a driven-in cock, said sleeve comprising a section on the cock side for receiving a tapping member of the cock and a section on the container side with a forward cutting edge to sever the sealing diaphragm.

4,135,637

CENTER VENTING CLOSURE SYSTEM

Rodney R. Hannula, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 7, 1978, Ser. No. 875,871
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—271 7 Claims



1. In a hand operable easy opening closure system of the type wherein a flexible exterior tape and interior sheet material are employed to removably seal a preformed opening in an end portion of a container adapted to withstand sub-atmospheric and super-atmospheric pressures, the improvement comprising in combination:

a. a vent opening centrally disposed in said end portion, said vent opening being of sufficient area so as to permit said exterior tape and interior sheet material to be bonded to each other in the area of said vent opening such that removal of said exterior sheet vents said container to ambient pressures by pulling the portion of said interior sheet in said vent opening therethrough, the area of said vent opening not being so large as to cause excessive disturbance of the contents of said container during the venting operation;

b. a pour hole, separated from said vent opening which is disposed adjacent the edge of said end portion;

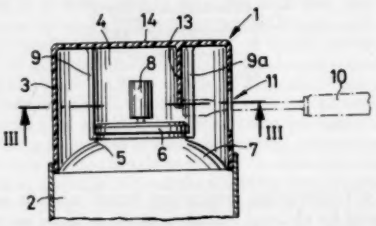
c. a rectangular exterior tape having a body portion and a grip portion overlapping said body portion, said body portion and grip portion being securely affixed to each other adjacent the edge of said container portion, said body portion being aggressively bonded to said container portion circumjacent and covering said pour hole, and said grip portion being aggressively bonded to said container portion circumjacent and covering said vent opening.

4,135,638

SPRAY CAN SAFETY CAP

Rudolf H. Wandl, Binau, Fed. Rep. of Germany, assignor to Kurt Vogelsang GmbH, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,696
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 7712650[U]
Int. Cl.[2] B65D *43/26*
U.S. Cl. 220—284 14 Claims



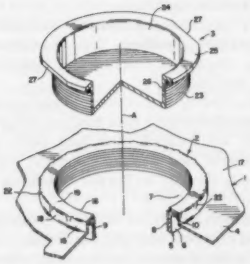
1. A safety cap for spray cans, the safety cap comprising an inner and outer cap part, the inner cap part being provided with at least one longitudinally extending slot and a lower edge adapted to fit beneath an edge of a dome supporting a valve body of the spray can, the outer cap part surrounding the inner cap part with a space therebetween and being provided with a window means arranged radially opposite the at least one slot of the inner cap part for permitting access to and spreading of the at least one slot, characterized in that a stop means, radially displaced relative to a center of the safety cap, is disposed between the at least one slot and the valve body for preventing a tool inserted through the window means from contacting the valve body.

4,135,639

CLOSURE CONSTRUCTION

Glenn W. Dillon, Crete, and Albert H. Lindell, Hazelcrest, both of Ill., assignors to Stock Equipment Company, Cleveland, Ohio

Filed May 8, 1978, Ser. No. 903,539
Int. Cl.[2] B65D *41/04*
U.S. Cl. 220—288 11 Claims



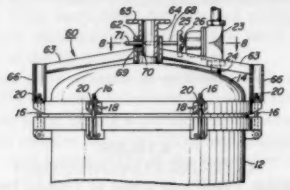
1. A closure construction for a container, comprising a flange member having an axially extending portion with an axially extending opening and a thread and, fixed to said axially extending portion, a radially extending flange portion that has a periphery having at spaced intervals thereon protuberances that extend generally radially outwardly of the flange portion and that are formed by compressing the metal of the flange portion transversely thereof so that the metal is caused to deform and extend radially to form said protuberances and to form depressed portions within the periphery of the flange portion at the protuberances so that said depressed portions and said protuberances are of thinner cross section than the edge portions of said flange portions between said protuberances, and a container wall to which said flange member is rigidly secured, said container wall including a major portion of the container wall and a minor portion of the container wall that is axially offset from said major portion and comprises a radially extending wall portion that contains an opening surrounding said axially extending opening of said flange member and that extends over the adjacent side of said flange portion of said flange member and over said protuberances and an axially extending wall portion that is formed over and extends around and under said protuberances at the periphery of said flange portion to clamp them against said radially extending portion of said container wall to secure said flange member in place in said offset portion of said container wall against movement relative to said container wall, said axially extending portion of said offset portion of said container wall between the parts thereof engaging said protuberances being closely adjacent the periphery of said flange portion between said protuberances and said radially extending portion of said offset portion of said container wall closely engaging said flange portion of said flange member over a substantial area.

4,135,640

SAFETY CLOSURE DEVICE FOR A PRESSURE VESSEL

Arthur E. MacQuilkin, Downers Grove; Elmer J. Kulousek, Berwyn, and Earl A. Borre, Itasca, all of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jul. 5, 1977, Ser. No. 812,563
Int. Cl.[2] B65D *45/00*
U.S. Cl. 220—316 6 Claims



1. Safety apparatus for preventing the opening of the cover of a pressurized vessel while the pressure in the vessel is different from ambient pressure, a pressure relief valve being mounted to said cover and said cover being secured to said vessel by a plurality of hold-down bolts, comprising

a plurality of tubular members,

support means mounting said tubular members in mutually relative positions enabling the simultaneous location thereof over respective ones of said bolts to prevent the removal of said bolts,

guide means carried by said cover and cooperating with said support means between a first position wherein said tubular members are located over said bolts and a second position wherein said tubular members are not located over said bolts thereby to permit loosening of said bolts, and

means connected to said relief valve for locking said support means in said first position when said relief valve is closed,

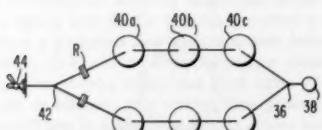
whereby said bolts cannot be removed to release said cover from said vessel while said relief valve is closed.

4,135,641

APPARATUS AND METHODS FOR DISPENSING FLUID UNDER PRESSURE

Merton R. Fallon, Thousand Oaks, Calif., and Thomas W. Clements, Ambler, Pa., assignors to Draft Systems, Inc., Northridge, Calif.

Continuation of Ser. No. 488,666, Jul. 15, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,648
Int. Cl.[2] B67D *1/04*
U.S. Cl. 222—1 33 Claims



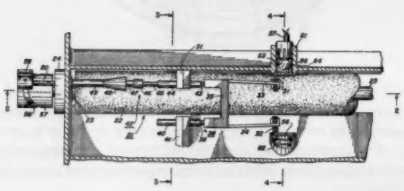
1. A method of dispensing gas containing liquid from a plurality of interconnected liquid containers coupled to a faucet wherein the faucet and containers form a part of a pressurized gas containing liquid dispensing system having a specified pressure input from a gas pressure source and a variable pressure drop across the containers during dispensing operations wherein said containers are connected in parallel with said faucet with discrete liquid lines connecting said containers with said faucet comprising the step of: automatically maintaining a specified constant gas containing liquid flow rate at the faucet at a predetermined foam rate while flowing liquid from each of said containers and thoughout the entire dispensing operation and maintaining a predetermined constant gas containing liquid flow rate in each discrete liquid flow line while flowing liquid at a rate from each of said containers substantially equal to said specified constant flow rate divided by the number of parallel connections.

4,135,642

WIPER ARRANGEMENT FOR TONER LEVEL SENSOR

John E. Forward, Penfield; George A. Muller, Pittsford, and Douglas P. Connolly, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,748
Int. Cl.[2] B41F *31/06*
U.S. Cl. 222—23 7 Claims



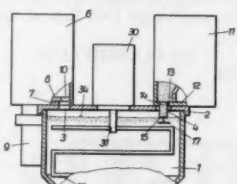
1. In combination with a toner dispenser including a hopper adapted to hold a quantity of toner, said hopper having an elongated opening adjacent the bottom thereof and a rotatable cylindrical dispensing roll located in said opening, a low toner level indicator arrangement comprising a light source, a photocell, said light source and photocell mounted in opposed walls of said hopper such that light from said source passes across said hopper at a preselected level above the dispensing roll, said light source and photocell being isolated physically from said toner by transparent windows, and wiper pads mounted for movement across the surfaces of said windows in response to the rotation of said dispensing roll.

4,135,643

INGREDIENT METERING FLOW TUBE AND BAFFLE FOR PLASTIC RAW MATERIALS MIXER

Rudolf Mieschke, Möglingen, and Walter Mücke, Hochberg, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,523
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 7611930[U]
Int. Cl.[2] B67D *5/22*
U.S. Cl. 222—47 7 Claims



1. A self-interrupting gravity feed device which is particularly suited for use as an ingredient intake metering means of a plastic raw materials mixer, in conjunction with a hopper-type supply source of a flowable granular or pulverulent plastic raw material ingredient and a mixer receptacle arranged therebelow in which a plurality of raw material ingredients are mixed

in a rotating motion of the ingredients about a vertical axis, and from which the raw materials mixture is withdrawn by a plastic materials processing machine, the device comprising in combination:

a flow tube open on both ends and serving as a gravity flow conduit between said supply source and the mixture receptacle, the flow tube reaching a distance into said receptacle and having at least its lower end portion oriented substantially vertically and the contour of its lower opening coinciding substantially with a horizontal plane; and

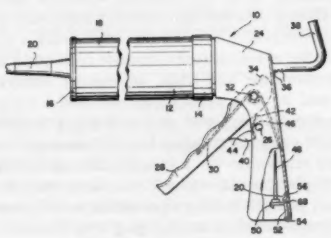
a substantially flat baffle carried by the flow tube, at a distance below its lower opening and in substantially parallel alignment therewith, the baffle having a contour which is similar to that of the lower flow tube opening and dimensions which are at least as large as those of said opening, thereby creating a discharge opening which is oriented radially with respect to the flow tube axis and which extends over at least a major portion of the flow tube circumference, so that, when the level of the rotating raw material ingredients inside the mixer receptacle reaches the level of the flow tube opening, the gravity discharge of said flowable raw material ingredient from the flow tube is substantially halted, until said level recedes again, as some of the materials mixture is withdrawn from the mixing receptacle.

4,135,644

CAULKING GUN

Clarence N. Pacetti, Rte. #1, Box 143, LaSalle, Ill. 61301

Filed Jul. 19, 1976, Ser. No. 706,278
Int. Cl.[2] B67B *7/28*
U.S. Cl. 222—81 **1 Claim**



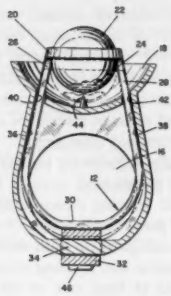
1. A caulking gun comprising a handle, a ramp mounted on said handle, said ramp being adapted for receiving a caulking cartridge having an openable nozzle sealed thereto at the base by a ruptureable seal, a ram mounted on said caulking gun for operatively engaging a caulking cartridge to dispense caulking compound from the nozzle of such cartridge, trigger means pivotally attached to said handle for incrementally advancing said ram into operative engagement with a caulking cartridge, cutting means on said trigger operatively engaging an opening in said handle for cutting the end from a nozzle of a caulking cartridge inserted in said opening when said trigger is pivotally moved in a direction for advancing said ram, said cutting means comprising a planar blade on said trigger, said opening in said handle being in a plane in said handle parallel to the plane of said blade, said trigger being pivotally mounted to swing said blade in a plane parallel to the plane of said opening, said blade having a first cutting edge and a second cutting edge intersecting at an apex, said apex being pivotable to move toward the transverse axis of said opening, puncturing means retractably secured to said handle for insertion into a nozzle of a caulking cartridge to break the seal at the base of such nozzle, said puncturing means comprising a spike pivotally secured to said handle on a spike pivot means, said spike being pivotally retractable into said handle through an opening in said handle extending from said spike pivot means, and retaining means mounted on said handle for releasably holding said puncturing means in a retracted position.

4,135,645

SELF-DEFENSE RING

Steven D. Kimmell, Granada Hills, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 1, 1977, Ser. No. 829,711
Int. Cl.[2] A44C *9/00*
U.S. Cl. 222—83 **16 Claims**



1. In a ring to be worn on the finger of a person for deterring an assailant, the combination comprising:

a ring member having an opening for inserting a finger therethrough;

a member coupled to said ring member in relatively movable relation thereto;

container means having a chemical substance therein, said container means being secured to one of said ring member and said movable member; and

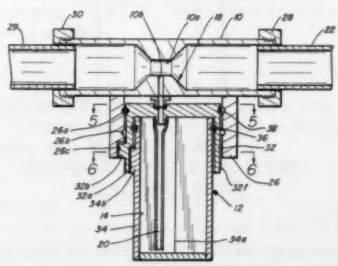
piercing means carried by the other of said ring member and said movable member for piercing at least a portion of said container means in response to relative movement between said ring member and said movable member, said movable member being positioned and configured for actuation by the person wearing the ring, using the same hand on which the ring is worn.

4,135,646

APPARATUS FOR DISPENSING FLUIDS

Frances M. Shaw, 2100 Winrock #12, Houston, Tex. 77057

Filed Feb. 9, 1977, Ser. No. 767,204
Int. Cl.[2] B05B *7/30*
U.S. Cl. 222—144 **19 Claims**



1. Dispensing apparatus comprising:

(a) conduit means for conducting a first fluid flow;

(b) housing means for holding fluid for selective dispensing by introduction of said fluid from said housing means into said first flow, and including a plurality of chambers such that each said chamber may hold a separate supply of fluid for said selective dispensing;

(c) passage means for selectively conduting a second fluid flow from said housing means to said conduit means for

selectively introducing said fluid from said housing means into said first fluid flow;

(d) control means selectively movable, by manipulation of said housing means relative to said conduit means, between a first configuration in which said second fluid flow may be so conducted from at least any one of said chambers at a time, and a second configuration in which said fluid flow is interrupted, said control means including base means fixed, relative to said conduit means, and cap means, as part of said housing means, whereby said base cooperates with said cap means to releaseably connect said housing means to said conduit means, and said cap means includes path means for communicating said chambers with said passage means for conducting said second fluid flow from said chambers;

(e) seal means for selectively sealing said conduit means to said housing means; and

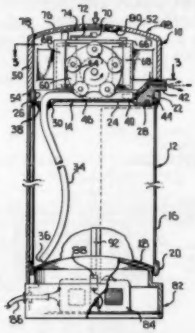
(f) wherein said housing means is movable between a first translational position, in which case said control means is in said first configuration with said seal means sealing said conduit means to said housing means and said path means communicates at least one of said chambers with said passage means, and a second translational position, in which case said control means is in said second configuration and said path means does not communicate any chamber with said passage means.

4,135,647

MOTOR DRIVEN DISPENSING UNIT FOR CONTAINERS

Carmen T. Mascia, Clarendon Hills, and Gary K. Hasagawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,346
Int. Cl.[2] F04B *43/12*
U.S. Cl. 222—211 **10 Claims**



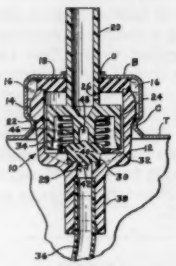
1. A dispensing unit for dispensing the contents of a can and like containers, said dispensing unit comprising a resilient tube having an inlet at one end and a dispensing nozzle at the other end, mounting means for mounting a portion of said tube against a wall of a container, a mechanism for intermittently and progressively applying pressure against said tube portion to effect a moving collapsing thereof against the same container wall and thus produce a pumping action in said tube, and a carrier for said mechanism, said carrier having attaching means for releasable attachment to the same container for positioning said mechanism relative to said tube portion.

4,135,648

METERING VALVE FOR PRESSURIZED DISPENSING CONTAINERS

Barry F. White, Merrimack, N.H., assignor to Summit Packaging Systems, Inc., Manchester, N.H.

Filed Oct. 26, 1977, Ser. No. 845,646
Int. Cl.[2] B65D *83/14*; G01F *11/28*
U.S. Cl. 222—402.20 **2 Claims**

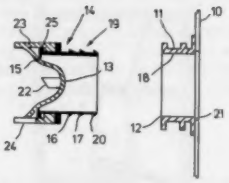


1. A dispensing valve for releasing measured amounts of pressurized fluid from a storage container upon each actuation of the valve, comprising a valve housing having a fluid inlet and a fluid outlet at respectively opposite ends and a metering chamber intermediate said ends, an annular sealing gasket carried by said housing at its outlet end and a reciprocable plunger passing through said gasket forming a sliding seal therewith, said plunger extending into said chamber in peripherally spaced relation to the side walls thereof, spring means engaging said plunger and urging it normally outwardly of said chamber, said plunger having a peripheral enlargement intermediate its longitudinal extent engaging with the inner margin of said annular gasket within said chamber in the outer position of said plunger, a fluid passage in said plunger open to atmosphere at its outer end and a restrictive discharge port in the side of said plunger and communicating with said passage above said enlargement, said discharge port being normally disposed outside said metering chamber but moved thereinto when said plunger is depressed, said valve housing having an annular valve seat at its inlet end the seat being formed with an axially disposed inlet opening, said valve seat being spaced from the inner end of said plunger when the latter is in its normal outer position a distance greater than the axial distance said plunger must be depressed to bring said plunger port into communication with said metering chamber, and a spherical resilient compressible valve member disposed within said chamber between said seat and the inner end of said plunger, said valve member being slightly larger in diameter than the diameter of said valve seat, said valve member having a diameter not exceeding the distance from the inner end of said plunger to said seat but sufficiently great such that any axial play between the plunger and the valve member, in the normal outer position of said plunger, is less than the distance said plunger must be depressed to bring its discharge port into communication with said metering chamber, the valve seat opening being shaped with inward projections spaced about its circumference normally to thereby support the valve member off the seat and preclude the undesired seating of the valve except when it is engaged by said plunger.

4,135,649
LIQUID DISPENSING TAP

Richard D. Baldwin, Dural, and Stanley E. Edwards, Castle Hill, both of Australia, assignors to Lindeman (Holdings) Limited, Lidcombe, Australia

Filed May 23, 1977, Ser. No. 799,336
Claims priority, application Australia, May 28, 1976, PC6090
Int. Cl.[2] B67D *3/04*
U.S. Cl. 222—511 **7 Claims**



1. A tap adapted to be fitted to a filling tube of a liquid container, comprising:

means defining a spout within said tap;

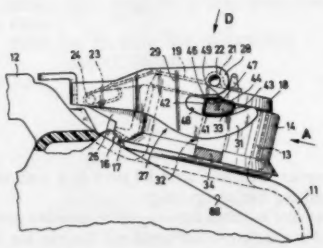
elastically deformable diaphragm means operatively connected to said spout means and movable substantially within a transverse, radial plane for controlling the issuance of said liquid from said container through said spout means; and

sleeve means interposed between said diaphragm means and said filling tube, one end of said sleeve means being sealingly disposed internally of said filling tube, and the other end of said sleeve means defining a sealing surface disposed internally of said diaphragm means for sealingly engaging said diaphragm means so as to prevent the issuance of said liquid from said container through said spout means.

4,135,650
DEVICE FOR DISCHARGE NOZZLES ON CANS

Wolfram Schiemann, Eugen-Nagele-Strasse 17, 714 Ludwigsburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 467,638, May 7, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,550
The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.
Int. Cl.[2] B65D *5/72*
U.S. Cl. 222—572 **5 Claims**



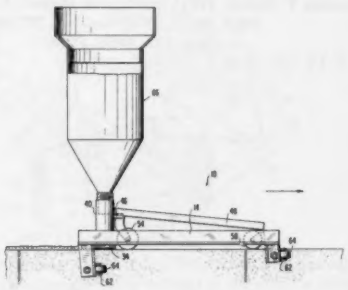
1. A blow-molded thermoplastic can having front and side walls, a straight face portion, a nozzle blow-molded integral therewith, handle means, and cover means for closing off said nozzle, said nozzle being rooted in energy consuming means in the wall of said can, blow-molded integral therewith, said energy consuming means having the form of a protuberance, extending from said straight face portion of the can, said protuberance leading directly from and being surrounded by said straight face portion and comprising a main bulging portion having an arc length of at least 50 degrees extending outwards from said straight face portion on the side of said nozzle directed away from said handle means, said nozzle being rooted below said handle means and said main bulging portion of said protuberance extending upwards and spacing said nozzle from said straight face portion from which said protuberance extends and being of such thickness

and operably associated with said nozzle to snap substantially inwards into said straight face portion upon impact forces of substantial strength on said nozzle, substantially altering the longitudinal axis of said nozzle, and to move substantially outwards from said straight face portion to return the longitudinal axis of said nozzle to said unaltered position.

4,135,651
DEVICE FOR APPLYING MORTAR

Brent M. Hession, and Rodney J. Hession, both of P.O. Box 432, Marrero, La. 70073

Filed Jun. 17, 1977, Ser. No. 807,505
Int. Cl.[2] B05D *1/26, 1/30;* F04G *21/16*
U.S. Cl. 222—611 **8 Claims**



1. A device for applying mortar to a course of masonry units being laid into a wall or the like with said units having side faces and a top surface, comprising, a frame member, a plurality of wheels connected to said frame member for supporting and moving said frame member along the top surface of said masonry units, dispensing nozzles mounted on said frame member for directing beads of mortar upon the top surface of said masonry units as said frame member is moved over said top surface, said frame member includes side elements arranged in spaced parallel relation to one another and adjustable end members for varying the spacing between said side elements and said dispensing nozzles, and mortar containers mounted on said dispensing nozzles.

4,135,652
COMBINATION BOOT SLIP AND JACK

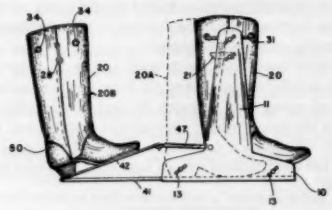
Henry W. J. Patton, Snyder, Tex., assignor to Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 23, 1977, Ser. No. 771,083
Int. Cl.[2] A47J *51/02*
U.S. Cl. 223—116 **2 Claims**

1. A device for use installing a boot on a foot of the user without the use of the user's hands, comprising

a base plate to which a pair of spaced vertical standards is mounted, together with pivotal means shaped to fasten about the shank of the boot for retention of the boot while the user removes his foot from said boot, in which the pivotal means comprises a U-shaped boot jack shaped to fasten about the shank of a boot and pivoted to each standard with a treadle hooked to said boot jack, said treadle pivotably mounted to an extension of the base plate behind the boot jack, such that downward pressure applied on said treadle by a second foot of a user applies a downward force to the boot jack while simultaneously

pivoting the boot jack to permit the user to withdraw upwardly and rearwardly a first foot out of a boot, the



shank of which is fastened in said boot jack, and such that the said first foot may be withdrawn towards the said second foot positioned on the treadle.

4,135,653

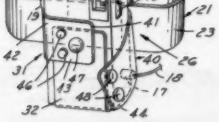
ARMBAND ASSEMBLY FOR CARRYING A PORTABLE RADIO

Norman T. Sieloff, 22125 Margareta, Detroit, Mich. 48219

Filed Jan. 7, 1977, Ser. No. 757,518

Int. Cl.[2] A45C *11/00*

U.S. Cl. 224—5 H **5 Claims**



4. An armband assembly for carrying a portable radio to enable said radio to be selectively secured about and removed from a person's arm for transportation thereabout in such a position that said person is normally able to hear the audio sounds generated by the radio both directly and via a fixed length cord from an ear plug adapted to be retainably inserted in said person's ear, said armband assembly comprising first adjustably positionable strap means for encircling at least a portion of said person's arm so as to be secured and carried thereby, and second strap means fixedly secured to an intermediate portion of said first strap means for at least partially encircling said radio so as to secure the position thereof with respect to said first strap means, said first strap means including a band of elastic-like stretch material which expands when being fitted to said person's arm and then contracts to remain securely carried thereon, said first strap means including a first generally rectangular strap having opposite end portions and an intermediate central portion, said first strap means further including adjustable fastening means carried by said opposite end portions for adjustably securing said first strap to various selected degrees of tightness about different diameters of arms, a third generally rectangular strap comprising elastic-like stretch material and having an intermediate portion and opposite end portions, fastening means carried by one end of said second strap and both end portions of said third strap, means on the opposite end portion of said second strap for fixedly securing said first, second, and third straps together proximate said intermediate central portion of said first strap such that said second strap is generally perpendicular to said first strap and forms a T-like configuration therewith and said third strap being generally parallel to said first strap, said second and third straps being operatively joined to at least partially enclose said radio and securely hold said radio with respect to said first strap.

4,135,654

RUCKSACK FRAME

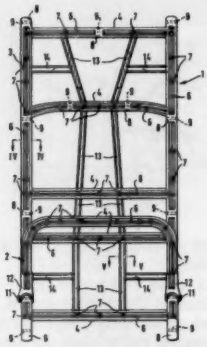
Cheuk S. Chu, Kowloon, Hong Kong, assignor to Yip Hing Camping Goods Manufactury Limited, Hong Kong

Filed Apr. 11, 9177, Ser. No. 786,216

Claims priority, application United Kingdom, Apr. 13, 1976, 15080/76

Int. Cl.[2] A45F *3/08*

U.S. Cl. 224—25 A **5 Claims**



1. A rucksack frame comprising longitudinal and transverse plastics members which are substantially tubular but are open towards the rear of the frame so that they are of generally C-shaped cross-section, each said member having an integral rib extending along its interior and with each member having integral cross-pieces extending across its interior at spaced intervals.

4,135,655

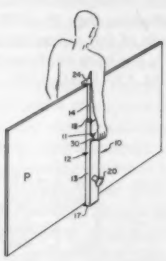
PANEL CARRIER AND HANDLING DEVICE

Averil L. Brown, P.O. Box 843, Corning, Calif. 96021

Filed Jun. 13, 1977, Ser. No. 805,787

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—45 M **2 Claims**



1. A carrier for sheet material such as a wall board, wood panels, and the like comprising:

(1) a bar-like member having a base member and a movable member telescopically arranged therein for longitudinal movement with respect to each other;

(2) a foot portion on one end of said base member;

(3) a cap member on said movable member having a lateral projection thereon for limiting movement of said movable member into said base member;

(4) a lateral extension on said foot member extending therefrom parallel to the lateral projection on said movable member and cooperating therewith to provide a pair of clamping jaws adapted to engage opposite edges of a panel resting against one surface of said bar-like member;

(5) spring means between said base member and said movable member for urging said clamping jaws into clamping

engagement with opposite edges of a panel disposed against said one surface of said bar-like member;

(6) handle means including a cross palm hand grips on said base member, adjacent the upper end of said base member, and extending laterally from that surface thereof opposite said one panel engaging surface from which said clamping jaws extend;

(7) an upturned lip on the lateral projecting jaw of said base member for maintaining a panel clampingly engaged by said clamping jaws adjacent the bar-like member during use thereof; and

(8) said base member of said bar-like member being of a length slightly greater than one half the width of a standard size of sheet material to be carried thereby for locating said cross palm grip handle on the opposite side of the carrier.

4,135,656

NICKEL BASE BRAZING ALLOY

Marvin J. Stern, Seattle, Wash., assignor to Alloy Metals, Inc., Troy, Mich.

Division of Ser. No. 681,957, Apr. 30, 1976, Pat. No. 4,075,009. This application Oct. 17, 1977, Ser. No. 842,650

Int. Cl.[2] B23K *1/04, 35/30*

U.S. Cl. 228—263 **3 Claims**

1. A method of joining metal parts, particularly nickel, carbon and low alloys and stainless steel, comprising the steps of:

contacting the metal parts to be joined;

applying a brazing alloy to said parts, adjacent the contacting surfaces, said brazing alloy consisting essentially of, by weight:

manganese — 19 to 23%
silicon — 5 to 8%
copper — 4 to 6%
boron — 0.6 to 1.8%
rare earth — 0.01 to 0.2%
tantalum — 0 to 3%
molybdenum — 0 to 3%
columbium — 0 to 3%
tungsten — 0 to 3%
aluminum — 0 to 3%
nickel — Balance.

4,135,657

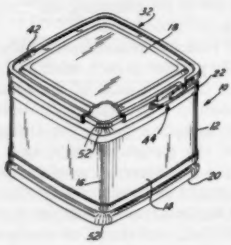
FIBER DRUM AND LOCKING RIM ASSEMBLY

Philip A. Benson, Glen Head; Thomas A. Haire, Medford; Elmer J. Desher, North Babylon, all of N.Y., and Herbert L. Carpenter, Jr., Cullman, Ala., assignors to Greif Bros. Corporation, Delaware, Ohio

Filed Jan. 25, 1978, Ser. No. 872,058

Int. Cl.[2] B65D *15/02*

U.S. Cl. 229—5.7 **14 Claims**



1. An improved fiber drum comprising a tubular body having a plurality of sides and made of wound laminated layers of fibrous material, each side of said body being transversely convex, and the corners joining said sides together being rounded, the tubular body having an open top end and a closed bottom end, a metal reinforcing chime disposed around the tubular fiber body at one end thereof, the tubular body and reinforcing metal chime being formed into an external groove and an internal bead extending completely around the drum a short distance from the end thereof, the tubular fiber body and said reinforcing metal chime, beyond said bead, being curved inwardly, and the reinforcing metal chime being worked at least at one of the corners into pleats to facilitate the formation of a relatively deep external groove by contracting the metal of the chime around said one corner to a predetermined extent in forming the deep external groove.

4,135,658

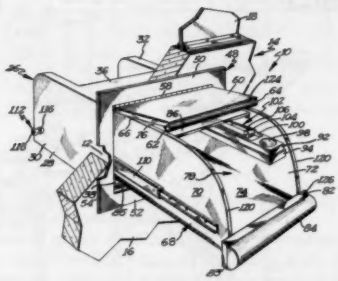
SERVING DEVICE

Bruce E. Hagberg, 1910 Olive La., Wayzata, Minn. 55391

Filed Jun. 24, 1977, Ser. No. 809,545

Int. Cl.[2] 312 *286;311*

U.S. Cl. 232—43.1 **20 Claims**



1. Device for serving merchandise from a building having a wall, with the merchandise being located in the interior of the building and the person desiring to receive the merchandise being located outside the building, with the wall including an aperature, comprising, in combination: a frame arranged to fit the aperture of the wall and extending into the interior of the building, with the frame defining a frame interior and including first and second vertically arranged sides, a horizontally arranged bottom interconnected between the sides, a horizontally arranged top interconnected between the sides, a first, outside, open end, and a second, inside end interconnected between the sides and to the bottom, with the sides of the drawer including camming surfaces, with the frame including open portions for allowing access to the frame interior from the interior of the building; a drawer including first and second vertically arranged sides, a horizontally arranged bottom interconnected between the sides, an open top, a first, outside, open end, and a second, inside vertically arranged end interconnected between the sides and to the bottom; means for movably mounting the drawer within the frame interior from a first, open position extending out of the frame to the exterior of the building to a second, closed position located within the frame interior; a first door pivotally mounted to the frame; an elongated member attached to the drawer and extending across the first, open end, with the first door and the elongated member closing the first, open end of the frame when the drawer is located in its second, closed position; a second door pivotally mounted to the drawer, with the pivot axis of the second door being located slightly inside of the top of the frame when the drawer is located in its second, closed position such that the door abuts with the top of the frame when the drawer is located in any position other than in its second, closed position to prevent the second door from being opened when the drawer is located in a position other than in its second, closed position for substantially preventing air communication between the exterior and interior of the building when the drawer is located in a position other than in its second, closed position; and trough means attached to the first door

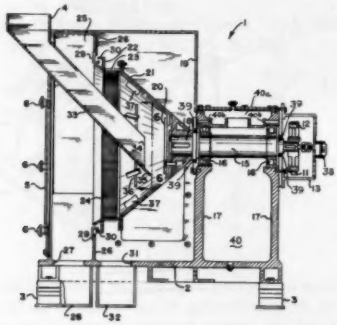
and extending the full length of the first door for interfitting with and being captured between the camming surface and the elongated member when the drawer is in its second, closed position for preventing the first door from opening when the drawer is in its second, closed position.

4,135,659

HORIZONTAL CENTRIFUGAL SEPARATOR

Harry E. Derton, Cahokia, Ill., and Dewey M. Cope, Affton, Mo., assignors to Centrifugal & Mechanical Industries, Inc., St. Louis, Mo.

Filed Nov. 8, 1976, Ser. No. 739,708
Int. Cl.[2] B04B *1/08, 1/12*
U.S. Cl. 233—3 **10 Claims**



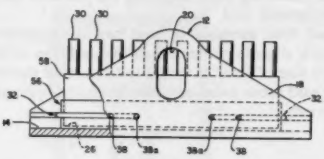
1. A centrifugal separator for use in segregating a liquid material from wetted solid components, and to attain an approximate drying of said solid components, comprising, an open bowl means arranged for revolving about an approximate horizontal axis, said bowl means having a rim and a base, a shaft means coupling to said bowl means and provided for supporting the same during its horizontal rotation, said bowl means flaring outwardly in a direction away from said shaft means and towards its opening, a housing provided for supporting said bowl and shaft means in rotation, motor means associated with said housing and upon energization capable of rotating said bowl and shaft means, said bowl means having perforations at least proximate its rim to accommodate the separation of said liquid from the solid components arranged therein and to attain an approximate drying of the said solid components, said perforated rim portion being disposed with respect to its integral bowl to provide for a temporary retention of the said solid components during their movement towards discharge out of the said bowl and to stimulate their said drying thereat, with the force of the incoming solid components urging the removal of previously deposited and temporarily retained solid components away from the said perforated rim and out of the said bowl, a chute mounted upon said housing and extending into the said flared open end of said bowl means for deposition of the said wetted components proximate its base, a deflector disposed within the bowl means and connecting to one of said housing and chute and provided for facilitating the transfer of said entering components into the influence of the centrifugal forces generated by the revolving bowl means, and vane means provided upon the inner surface of said bowl means proximate said deflector to facilitate the uniform arrangement and temporary accumulation of the incoming solid components within the said rotating bowl means.

4,135,660

ADJUSTABLE TUBE RACK CARRIER

Thomas E. Conn, Palo Alto, and Victor J. Grilli, Mountain View, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 20, 1977, Ser. No. 808,201
Int. Cl.[2] B04B *5/04*
U.S. Cl. 233—26 **4 Claims**



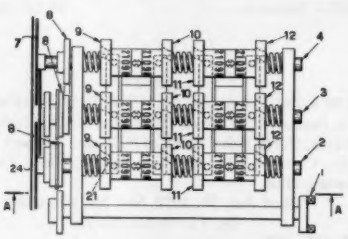
1. A centrifuge rotor for carrying test tube racks comprising:
at least two carriers, each pivotally mounted on said rotor; and
a pair of removable U-shaped clips located in said carrier, said carrier having a series of adjustment holes to provide variable positions for said clips within said carriers for adjusting the length of the receiving area in said carriers for said racks to accommodate various length racks and hold said racks symmetrically positioned on said carriers.

4,135,661

CONTROL DEVICE FOR A VALVE ACTUATOR

Umberto Filippini, Lastra a Signa (Florence), and Pierluigi Bianchini, Florence, both of Italy, assignors to Nuovo Pignone S.p.A., Italy

Filed Mar. 19, 1976, Ser. No. 668,805
Claims priority, application Italy, Mar. 20, 1975, 21453 A/75
Int. Cl.[2] G06M *1/276*
U.S. Cl. 235—132 R **2 Claims**



1. A control device for indicating the number of revolutions of a rotatable member comprising:
a plurality of rotatable spaced-apart shafts, said shafts being substantially parallel to each other and in the same plane, gear means coupling each of the rotatable shafts to an adjacent shaft in a predetermined driving ratio, each of said shafts including means for indicating the angular position of the particular shaft, said indicating means comprising a disc mounted axially on the shaft with numerals arranged circumferentially thereabout such that units, tens and hundreds are depicted on respective discs to indicate the revolutions of the rotating member in accordance with said predetermined driving ratios,
means coupling the rotatable member to the rotatable shafts so that said shafts are driven thereby such that the combination of means indicating the angular position of each shaft provides an indication of the number of revolutions by the rotatable member,
a plurality of substantially disc-like cams mounted axially on

each of the plurality of shafts, each cam having an angled groove extending from one face to the opposite face,

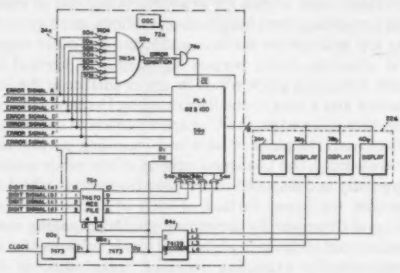
a pivotally mounted element carrying a plurality of cam followers, the cam followers each being urged to abut a particular face of a cam until said cam followers register with the cam grooves with rotation of the shafts so that the followers pass through the grooves to the opposite face of the cam and cause movement of the element, and

switch means being engaged by the element to effect an electrical contact at a predetermined time.

4,135,662
OPERATOR PROMPTING SYSTEM

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jun. 15, 1977, Ser. No. 806,747
Int. Cl.[2] G06F *11/00*; G01G *19/417*
U.S. Cl. 235—304 **14 Claims**



1. In a processing system comprising a data processor, operator input means operatively connected to the processor for transmitting data to the processor and display means operatively connected to the processor for visually indicating numeric data, the processor receiving data from the operator input means and processing the received data to provide numeric display signals, the display means receiving the numeric display signals and in response thereto visually indicating corresponding numeric data and with a plurality of possible error conditions existing in conjunction with the processor, the improvement comprising an operator prompting system, the processor including means for detecting an error condition and providing an error signal indicative of the presence of such condition, the prompting system including generating means for receiving the error signal and in response thereto generating a message signal, the display means including means receiving the message signal and in response thereto visually indicating the nature of the error condition as an alphabetically spelled phonetic operator prompt message, the prompting system further including means for receiving the error signal and in response thereto preventing the numeric display data signals from being received by the display means, whereby the operator is apprised of the nature and existence of the particular error condition without distraction of attention from the normal data entry routine.

4,135,663
SYSTEM FOR RECOGNIZING BAR CODE INFORMATION

Tadao Nojiri, Kariya, and Akio Sugiura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

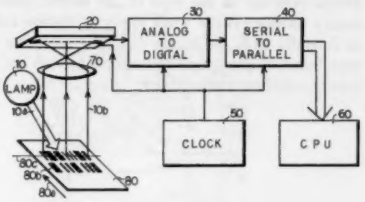
Filed Aug. 29, 1977, Ser. No. 828,593
Claims priority, application Japan, Sep. 10, 1976, 51-109172
Int. Cl.[2] G06K *7/10*; G08C *9/06*; G06K *19/06*
U.S. Cl. 235—463 **4 Claims**

1. A system for recognizing bar code information comprising:

an object carrying the information constituted by a plurality of bar codes each of which has four black bars and three white bars, one of said bar codes being arranged at either the head or the tail of said information and constituted as an index code in a different manner from the other of said bar codes constituted as numerical codes in such a manner that one of said four black bars and one of said three white bars have wide widths and the other of said four black bars and the other of said three white bars have narrow widths;

scanning means adapted to scan said bar codes at a constant speed in a direction transverse to said bars for serially producing an output signal having output levels indicative of the colors of said bars and time widths proportional to the widths of said bars;

converting means connected to sequentially convert said output signal produced while one of said bar codes is scanned into a code signal indicative of corresponding one of said bar codes;



a plurality of memory means connected to be triggered to memorize said code signal;

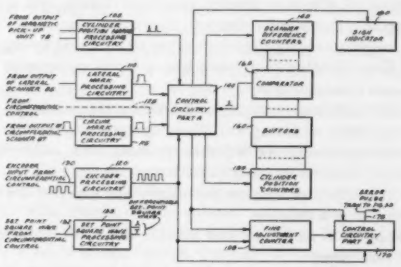
discriminating means for discriminating, in response to said output signal corresponding to said index code, whether the scanning direction of said scanning means is forward or reverse; and

sequence control means connected to trigger said memory means one by one at every completion of converting operation of said converting means and to reverse the sequence according to which said memory means are triggered when the discrimination result of said discriminating means is reversed, whereby each of said bar codes is memorized by corresponding one of said memory means irrespective of the reversion of the scanning direction of said scanning means.

4,135,664
LATERAL REGISTER CONTROL SYSTEM AND METHOD

Mark S. Resh, Danville, Ill., assignor to HurletronAltair, Inc., Danville, Ill.

Filed Mar. 4, 1977, Ser. No. 774,664
Int. Cl.[2] B41F *5/16*; B65H *23/02*
U.S. Cl. 235—475 **10 Claims**



1. A lateral register control system for locating the lateral position of a rotary member at a work applying station to minimize lateral register errors on a traveling web; the web having had indicia applied before entering the work applying

station which indicia provide for discrimination of the lateral position of the web at the work station, the system including:

a source of clock pulses;

first means for sensing indicia on the web in proximity to the work applying station and operable to obtain a count of clock pulses representing the instantaneous lateral position of the web;

second means comprising a cylinder having a first and second indicia at a predetermined angle with respect to one another, mechanically connected to the rotary member, for sensing the lateral position of the rotary member at the work applying station and operable to obtain a count of clock pulses representing the instantaneous lateral position of the rotary member at the work applying station; and

third means connected to said source of clock pulses said first means and said second means for comparing the lateral position of the web to the lateral position of the rotary member at the work applying station and operable to laterally shift the rotary member such that the difference between the lateral register of the web and that of the rotary member is minimized.

4,135,665

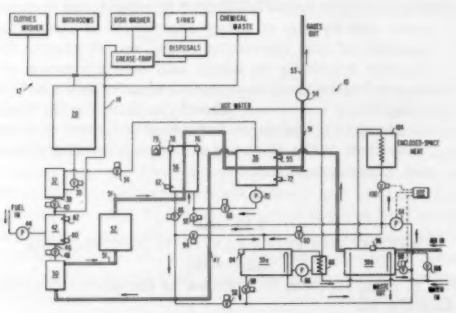
INTEGRATED SEWAGE TREATMENT SYSTEM

Robert H. Nealy, C-11 Fox Run, Warminster, Pa. 18974

Continuation-in-part of Ser. No. 477,539, Jun. 7, 1974, abandoned. This application Mar. 9, 1977, Ser. No. 775,805

Int. Cl.[2] F23G *3/00;* **F24D** *3/00;* **C02C** *3/00*

U.S. Cl. 237—8 R **24 Claims**



1. An integrated system for modification of the natural temperatures which would otherwise prevail within a building, for the heating of water as required for human purposes, and for treating of domestic sewage generated within said space to acceptable community disposal standards comprising

a vessel receiving the waste from an enclosed living space,

a filter dividing said waste into a liquid component and a slurry component,

a homogenizer receiving said slurry component,

a collector receiving said liquid component,

a unit receiving said liquid component from said collector,

a fuel source supplying pre-selected amounts of fuel to said homogenizer wherein said slurry and said fuel are caused to form a mixture,

a burner to incinerate said mixture and form high temperature gases,

means to transmit said high temperature gases through said unit to heat and sterilize said liquid component, and

heat transfer means for utilizing the heat from said liquid component for energy to energize integrated space temperature modification and water heating functions.

4,135,666

ARTIFICIAL CROSS-COUNTRY SKIING PRACTICE SET

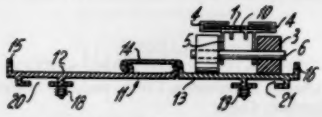
Heinz Dürst, Leatherhead, England, assignor to Tacole Etablissement, Vaduz, Liechtenstein

Filed Apr. 5, 1977, Ser. No. 784,920

Claims priority, application Switzerland, Apr. 15, 1976, 4840/76

Int. Cl.[2] E01B *23/00;* **A63B** *69/18*

U.S. Cl. 238—10 R **1 Claim**



1. A two path track formed of shaped rails for guiding skis provided with wheels for praticing skiing out of season, each rail comprising two longitudinal sections, each section including top and bottom surfaces and inner and outer edges, a central wheel receiving portion bounded by a vertical longitudinally extending guide rib on its upper surface at the outer edge thereof and a longitudinally extending U-shaped portion at the opposite inner edge, the U-shaped portion of one section being offset from the plane of its wheel receiving portion and facing downwardly, the U-shaped portion of the other section facing upwardly and disposed in the same plane as its wheel receiving portion, the lower surface of each of said sections including integral downwardly projecting ground engaging members to anchor said sections in place, said lower surfaces also including longitudinally extending recessed areas adjacent the outer edge, means fitted in said recessed areas to connect and hold the rails end to end after said two longitudinal sections are connected to one another inner edge to inner edge by press-fitting said U-shaped portions together to provide said two path track.

4,135,667

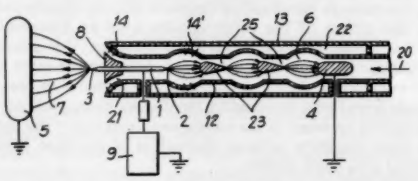
APPARATUS FOR THE ELECTROSTATIC COATING OF WORKPIECES

György Benedek, and Péter Hornung, both of Budapest, Hungary, assignors to Hajtómüvek és Festöberendezések Gyara, Budapest, Hungary

Filed Mar. 23, 1977, Ser. No. 780,472

Int. Cl.[2] B05B *5/02*

U.S. Cl. 239—697 **13 Claims**



1. Electrostatic spray apparatus comprising:

a feed conduit through which a stream of particles of coating material flow, the conduit outlet comprising a spray nozzle;

at least one intermediate conduit section formed at at least one enlarged charging chamber;

a charging electrode disposed within said conduit and having a functional end facing upstream, with respect to said particle feed conduit, and lying adjacent an end of said chamber;

at least one counter electrode disposed within said conduit and having an end both opposed to said functional end and lying adjacent the other end of said chamber; said elec-

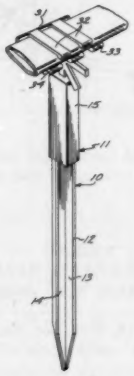
trode ends being of opposite polarities and connected to a high voltage source; and the conduit portion connected to and downstream of said chamber being smaller in flow cross-section than the upstream conduit section connected to said chamber.

4,135,668

SOAKER HOSE SUPPORT

Robert J. Winkler, Santa Ana; Colin G. Harris, Huntington Beach, and Terry A. Sprague, Fullerton, all of Calif., assignors to Alpha Nova Development Corp., Santa Ana, Calif.

Filed Apr. 7, 1977, Ser. No. 785,439
Int. Cl.[2] B05B *15/06*
U.S. Cl. 239—276 **2 Claims**



1. In combination with a soaker hose that has an elongate oval shape transverse cross section and said hose having a plurality of longitudinally spaced water discharge openings therein, a plurality of support assemblies that may removably engage said hose at a plurality of longitudinally spaced positions thereon to selectively hold said hose at any desired one of a plurality of positions relative to the earth surface when said support assemblies are partially embedded in the ground, each of said support assemblies including:

a. a clamp of channel shape transverse cross section that removably engages said hose and may remain in place on said hose when said hose is not in use, said clamp including a web that has first and second spaced parallel fingers projecting outwardly therefrom that removably engage opposite elongate external side surfaces of said hose, with said first and second fingers defined by first and second longitudinally spaced segments that are staggered relative to one another so that no longitudinal section of said hose is gripped by said segments in such a manner as to obstruct flow of water through said hose;

b. a spike that includes a lower elongate sharpened portion that may be forced into the ground to occupy a partially embedded position therein, and an upper elongate portion of sufficient strength as to withstand hammer blows directed on the upper extremity thereof to drive said lower portion into the ground;

c. engageable means adjacent said upper extremity of said upper portion of said stake and forming a part thereof;

d. a mount secured to said clamp and extending outwardly therefrom, said mount downwardly disposed when said clamp is in a hose supporting position, said mount including engaging means that removably engage said engageable means cooperating to support said clamp and hose at any one of said plurality of positions relative to the ground surface with said mount being a plate transversely positioned relative to said clamp and secured thereto, with said engaging means being a plurality of radially extending, circumferentially spaced segments that form a part of said plate, and said engageable means being a cavity that extends into said upper portion of said spike from said upper extremity thereof, and each of said segments capable of removably engaging said cavity to support said clamp and hose at a desired position relative to the ground surface on said stake; and

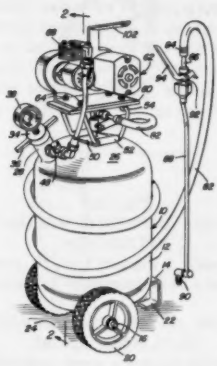
e. first means for preventing said hose from being inadvertently disengaged from said clamp.

4,135,669

PORTABLE, WHEELED ELECTRIC SPRAYER WITH PRESSURIZED LIQUID RESERVOIR

Edward B. Bridges, and Lillian K. Bridges, both of 1303 Stanton Ave., Waycross, Ga. 31501

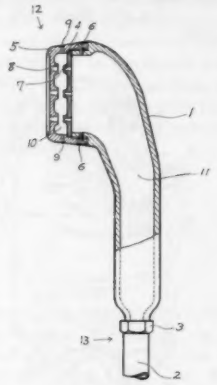
Filed Aug. 30, 1977, Ser. No. 829,198
Int. Cl.[2] B05B *7/24*
U.S. Cl. 239—373 **4 Claims**



1. A lightweight pressure sprayer assembly comprising a hollow pressure vessel, a filler neck opening into the interior of an upper portion of said vessel and including a removable fluid pressure sealing closure therefor, an upstanding liquid outlet tube opening upwardly through said upper portion of said vessel from the interior thereof in sealed engagement with said upper portion, the lower end of said tube opening outwardly within a lower portion of said vessel, a flexible pressure hose having one end connected to the upper end of said tube, a tubular spray wand having one end connected to the other end of said hose, said spray wand including a discharge spray head on the other end thereof and including a control valve therefor intermediate the opposite ends of said wand for controlling the flow of liquid through said wand, and a lightweight motorized air compressor mounted on said upper portion of said vessel and having a compressed air outlet opening into the interior of said vessel in sealed engagement therewith, said air outlet opening into the interior of said neck inwardly of said closure, said closure including an exterior pressure gauge supported therefrom opening into the interior of said vessel through said closure, said neck including a manually openable and closable vent valve supported therefrom for selectively venting the interior of said vessel to the ambient atmosphere, said sprayer including wheeled support means supported from a lower portion of said vessel by which said sprayer may be readily rolled over the ground, a generally horizontal mounting plate supported from and spaced vertically above said upper portion, said motorized air compressor being mounted atop said mounting plate and including an upper handle portion from which the total weight of said sprayer assembly may be supported and by which said sprayer assembly may be hand carried and/or lifted as one desires, the vertical spacing between said upper portion and said mounting plate providing a space therebetween for said upper end of said outlet tube and said one end of said pressure hose, said pressure gauge and vent valve being supported from said closure and neck, respectively, whereby a person preparing to remove said closure for

the purpose of adding liquid to the interior of said tank through said neck will be reminded to vent the interior of said tank to the ambient atmosphere through said vent valve before removing said closure.

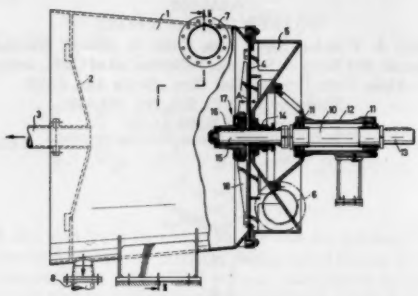
4,135,670
SHOWER DEVICE
Yoshio Sugimoto, Kishiwada, Japan, assignor to TSD Kabushiki Kaisha, Izumi-Ohtsu, Japan
Filed Nov. 2, 1976, Ser. No. 738,330
Claims priority, application Japan, Jan. 10, 1976, 51-2362
Int. Cl.[2] E03C *1/084*
U.S. Cl. 239—428.5 **2 Claims**



1. A shower device having a water injecting portion comprising a casing adapted to be connected to a water source and including a chamber to which water is supplied under pressure, a nozzle plate having a plurality of nozzles formed therein, a cover having an outer end face formed with water jet holes corresponding in number to said nozzles and aligned therewith, said face of said cover being spaced at all points from said plate so as to form a continuous air chamber therebetween, said cover being further formed with a plurality of individual air inlet openings around the circumference thereof directly communicating with said air chamber for admitting air into said chamber, and means for securing said cover and said plate, in said spaced relationship, to said casing, said securing means comprising screw members fixedly attaching said cover to said casing, said cover being formed with an annular recess for receiving said plate, and said casing including a cylindrical outer end portion which engages said plate and forces the same against a wall of said recess to retain said plate in position.

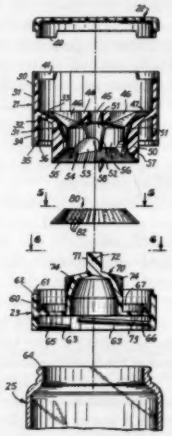
4,135,671
STOCK PULPER
Manfred Kohrs, Ravensburg, Germany, assignor to Escher Wyss GmbH, Ravensburg, Germany
Filed Sep. 29, 1977, Ser. No. 837,808
Claims priority, application Switzerland, Oct. 19, 1976, 13210/76
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.04 **9 Claims**

1. In a stock pulper, the combination comprising
a tank defining a separation chamber, said tank having a wall separating said chamber from the exterior of said tank;
a screen disposed in said wall for screening stock therethrough from said chamber;
a rotatable shaft extending through said wall; p1 a rotor within said chamber, said rotor having a hub mounted on said shaft in axially movable relation and fixed to said shaft for rotation therewith and a plurality of arms extending radially from said hub in spaced facing-relation to said screen;
a bushing disposed about said shaft in axially movable relation to said shaft, said bushing extending through said wall and being disposed in abutment with said hub; and



means for moving said bushing and said hub axially of said shaft to adjust the spacing of said arms relative to said screen.

4,135,672
GRINDING MILL FOR COFFEE BEANS AND THE LIKE
Walter Schlessel, Lawrence, N.Y., assignor to Gemco-Ware, Inc., Freeport, N.Y.
Filed Mar. 14, 1977, Ser. No. 777,072
Int. Cl.[2] A47J *42/04, 42/10*
U.S. Cl. 241—169.1 **14 Claims**



1. A grinding mill for coffee beans and like articles comprising a receiver including a bottom wall and peripheral side wall for receiving articles to be ground, said bottom wall having a plurality of passageways each sized for successively and gravitationally passing articles to be ground, a discharge member beneath and rotatably connected to said receiver and having a discharge opening communicating with said passageways for receiving material therefrom, and grinding means interposed between said passageways and discharge opening for grinding articles and passing granular material to said discharge opening, obstructing means on said discharge member generally between said grinding means and said plurality of passageways for rotation with said discharge member into and out of obstructing relation with said passageways, said obstructing means being configurated to simultaneously obstruct certain of said passageways and open other of said passageways, to

thereby limit the number of coffee beans and like articles which can be ground at any given time by said grinding means.

4,135,673

METHOD OF AVOIDING OR PREVENTING LOW-ORDER RIBBON WINDINGS IN THE WINDING OF FILAMENTS

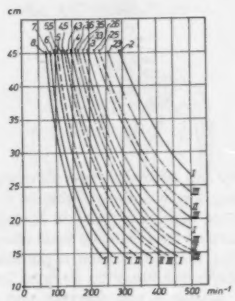
Manfred L. Gallus, and Hermann-Josef Stupp, both of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 14, 1977, Ser. No. 768,575

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1976, 2606208

Int. Cl.[2] B65H *54/38*

U.S. Cl. 242—18.1 **5 Claims**



1. In a winding process for the production of cheeses and cones of natural or synthetic, drawn or undrawn filaments wherein the filaments are wound onto a rotating bobbin guided by a traversing filament guide member, the improvement comprising producing exclusively ribbon windings of the order $k' > 2$ by controlling the traversing frequency DH of the guide member as a function of time or the radius of the cheese or the rotational speed of the cheese or an equivalent parameter at a constant ratio m'/k', where k' is the order of the ribbon winding and m' is the corresponding number of revolutions of the cheese.

4,135,674

ROLL-CHANGING DEVICE FOR WEB WINDING APPARATUS

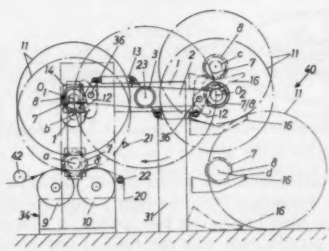
Bernhard Bartmann, Heidenheim, Fed. Rep. of Germany, assignor to J.M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,574

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649289

Int. Cl.[2] B65H *75/34*

U.S. Cl. 242—64 **19 Claims**



1. In a web roll winding machine, including a winding station for winding a web roll and a separate wound roll delivery station which is spaced from said winding station and to which a wound roll is to be delivered;

a roll changing apparatus, comprising:

a bearing block; a bearing block pivot mount positioned between said winding station and said delivery station;

a double arm lever having a first and a second arm, said lever being rotatively supported on said pivot mount on said bearing block for rotation of said lever;

a respective roll support rod engageable with each said arm of said lever, such that a plurality of wound rolls and of the cores on which the rolls are wound are supported on and moved by and with said roll support rod; said rod being of a length and a bending strength enough to support a plurality of cores and wound rolls in a row along said rod,

said lever first arm being movable from said winding station to said delivery station for moving a wound roll from said winding station to said delivery station, said lever second arm being at the same time movable from said delivery station to said winding station for moving new cores for web winding to said winding station; drive means for periodically moving said lever as described.

4,135,675

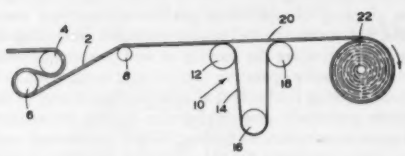
PAPER CARRIER STRIPPING METHOD AND APPARATUS

William A. Greiner, Jr., and Richard J. Evans, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 1, 1977, Ser. No. 802,308

Int. Cl.[2] B65H *17/02*

U.S. Cl. 242—67.1 R **2 Claims**



1. An apparatus for stripping the carrier from the back of a floor product and moving the floor product in a substantially non-stress applying condition so that the application of additional stresses is avoided, and winding the floor product in a roll comprising:

(a) a means for pulling the floor product attached to a carrier to a point short of its wind-up in a roll;

(b) a roll means placing the floor product with its carrier in a relatively flat condition;

(c) a three-roll structure having the two outside rolls with their upper surface in the same plane as the floor product in its flat condition whereby the floor product moves from the first outside roll to the second outside roll with the carrier stripped from the floor product as it moves from the first outside roll to the second outside roll;

(d) positioned between said two outside rolls there being a movably mounted third roll means positioned to accumulate excess carrier material and to maintain a stress on the carrier material as it moves from the first outside roll at which stripping is carried out to the point where the floor product and carrier are wound together in a roll;

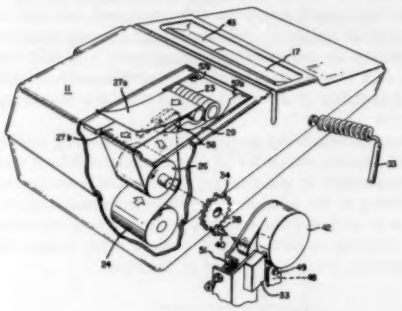
(e) said second outside roll means moving the carrier back into contact with the floor product, but not attached thereto, so as to support the floor product minus its carrier in a relatively non-stress applying condition, and

(f) means wrapping both the floor product and its unattached carrier in a roll.

4,135,676
AUTOMATIC TENSIONING MECHANISM FOR A CONTINUOUS WEB

Alexander Hunter, Chalfont, Pa., assignor to Transaction Management, Inc., Montgomeryville, Pa.

Filed Aug. 29, 1977, Ser. No. 828,851
Int. Cl.[2] B65H *17/02*
U.S. Cl. 242—67.2 3 Claims

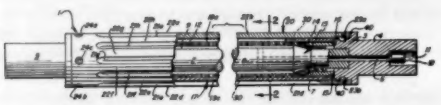


1. Automatic tensioning mechanism for a continuous web comprising, drive means, a source of electric power for said drive means, switching means operatively connected to control the flow of electric power to said drive means, a drive gear operatively connected to said drive means, a driven gear operatively connected to be driven by said drive gear, continuous web take up means comprising said driven gear and take up spindel for storing said continuous web, mounting means for pivotably mounting said drive gear with respect to said driven gear, said mounting means further comprising means operative upon pivoting of said drive gear to actuate said switching means, and means external to said automatic tensioning mechanism for controlling the feeding of said continuous web, said drive means being operative to drive said continuous web take up means during the feeding of said continuous web to thereby maintain essentially constant tension in said continuous web and upon termination of feeding of said continuous web said drive means causing a further take up in the slack in said continuous web until the restraining force within said continuous web no longer permits rotation of said driven gear whereupon said drive means continues to drive said pivotably mounted drive gear causing said pivotably mounted drive gear to revolve about the then stationary driven gear thereby causing said mounting means to switch said switching means and to in turn control the flow of electric power to said drive means.

4,135,677
PNEUMATIC SHAFTS, CHUCKS AND LIFTS FOR ROLL STOCK

Russell C. Warczak, Downers Grove, Ill., assignor to Cedco, Inc., Bensenville, Ill.

Filed Jul. 14, 1977, Ser. No. 815,593
Int. Cl.[2] B65H *75/24;* B21B *31/32*
U.S. Cl. 242—72 B 29 Claims

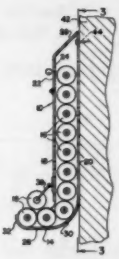


1. In pneumatic, roll handling devices of the air shaft, chuck and roll lift types having a pneumatic bladder and means for expansibly contacting roll stock and cores, the improvement which comprises a limited expansion bladder member assembly disposed internally thereof to actuate said expansible contacting means.

4,135,678
TOILET PAPER ROLL DISPENSER AND HOLDER

James A. Williams, 4120 Morning Pl., Sarasota, Fla. 33581

Filed May 16, 1977, Ser. No. 797,028
Int. Cl.[2] B65H *19/04*
U.S. Cl. 242—55.3 14 Claims

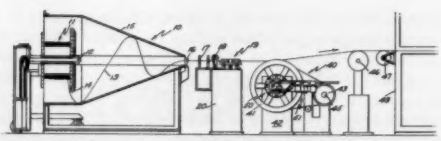


1. A container and dispenser for a plurality of rolls of tissue paper comprising a substantially J-shaped container having a vertically disposed main body portion having a front wall and a rear wall separated by a distance wide enough to accommodate snuggly but without friction a plurality of paper rolls disposed one above the other, an integral forward projecting lower portion having a top aperture and partial sidewalls leaving exposed a portion of the periphery of paper rolls displaced by gravity into said projecting lower portion, said lower portion having a bottom wall with an integral curvilinear rearward section gradually merging into said rear wall, an access opening formed in said body portion proximate the top thereof for filling said container and dispenser with a plurality of said paper rolls, and a paper roll holder mounted on the front surface of the front wall of said body portion proximate said lower projecting portion, wherein said paper roll holder is mounted at a predetermined distance above said aperture in said lower portion such that a fresh paper roll placed in said holder peripherally engages a paper roll disposed in said projecting lower portion.

4,135,679
MEANS FOR CONTROLLING A WIRE DISCHARGED FROM A FLYER PAYOFF

Thomas A. Murphy, Taunton, Mass.; Richard E. Long, Riverside, R.I., and Kenneth L. Tebo, Dudley, Mass., assignors to The Entwistle Company, Hudson, Mass.

Filed Jan. 23, 1978, Ser. No. 871,208
Int. Cl.[2] B65H *49/00*
U.S. Cl. 242—128 4 Claims



1. In combination with a flyer payoff, means for controlling the wire discharged from the flyer payoff comprising a first tensioning means including two groups of generally aligned rolls on parallel axes with the rolls of one group in lateral staggered relation with reference to the rolls of the other group and movable laterally toward the rolls of said other group to engage a wire passing through said groups at spaced locations and alternately on opposite sides of the wire, a second

tensioning means comprising a tension stand having a drum and a guiding means spaced from the drum about both of which the wire passes sufficiently to be in non slip relation with the drum and then passes on to its point of service, and brake means to retard the rotation of said drum and tension the wire passing about said tension stand.

4,135,680

FLAT STRIP SPOOL HAVING A CORE PROVIDED WITH STRIP FASTENING MEANS

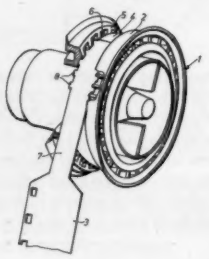
Rudolf Blank, Cologne, and Achim Kluczynski, Immekeppel, both of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Germany

Filed Jul. 15, 1977, Ser. No. 816,164

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1976, 2632766

Int. Cl.[2] **B65H** *75/28*

U.S. Cl. 242—74 **3 Claims**



1. A rotatable spool for receiving a film strip wound on the spool by rotation having

a pair of circumferential shoulders separated by an intermediate peripheral groove of a pair of facing side walls formed in said spool normal to a cylindrical plane girdling the spool intermediate said side walls and the adjacent shoulders so that the facing side walls are diametrically positioned and adapted to receive a leader of the film strip

means for releasably holding the leader of the film strip on the spool in the groove comprising the combination of

pairs of recesses formed in the facing side walls each pair having a recess in the respective facing side walls diametric to the other respective recess and said pairs being regularly spaced in the groove

teeth on the leader end of the strip adapted to fit into the pairs of recesses so that the leader end is engagable with the spool and retainable within the groove with a tangential fixing strength which substantially exceeds the radial fixing strength of the leader in the groove whereby the strip is secured to the spool by rotation of the spool to gather the strip on the spool into a wound film and the leader is releasable from the spool when the film is unwound.

4,135,681

WINCH ATTACHMENT FOR VEHICLE WHEELS

Wayne F. Cooper, 15806 Tepee Dr., Fountain Hills, Ariz. 85268

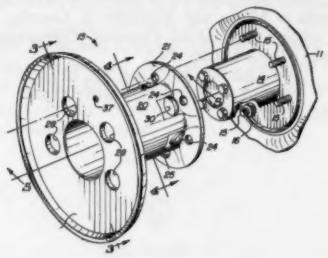
Filed Jan. 27, 1978, Ser. No. 872,927

Int. Cl.[2] **B66D** *3/00*

U.S. Cl. 242—95 **10 Claims**

1. A winch for mounting on a driving wheel attached to a vehicle axle by a plurality of wheel bolts, said winch including in combination:

a drum member having only first and second spaced flanges thereon for receiving therebetween a cable to be wound on said drum member; said first flange thereof having wheel bolt receiving holes therethrough for receiving at least some of said plurality of wheel bolts and having at least one enlarged hole therethrough for permitting the passage of a wheel bolt nut therethrough; said second flange has holes therethrough aligned with said wheel bolt receiving holes; and said drum member having recesses



therein adjacent said at least some of said wheel bolt receiving holes, but separated therefrom by solid portions of said first flange, to accommodate the head of a wrench.

4,135,682

EMERGENCY LOCKING RETRACTOR FOR AUTOMOBILES

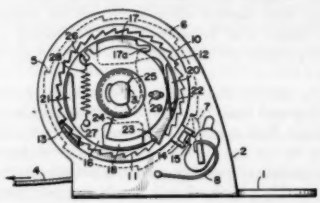
Yoshio Mizuno, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Nov. 8, 1976, Ser. No. 739,645

Claims priority, application Japan, Nov. 13, 1975, 50-154826[U]

Int. Cl.[2] **A62B** *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 B **6 Claims**



1. A seatbelt retractor mechanism comprising:

a frame;

a retractor shaft rotatably coupled to said frame for winding a seatbelt thereon;

a ratchet ring having internal ratchet teeth rotatably disposed on said retractor shaft;

an inertial plate rotatably disposed on said retractor shaft;

a rotor plate disposed on said retractor shaft and having an eccentric portion;

spring means for coupling said rotor plate and inertial plate in a fixed relative configuration except when an inpulsive force is applied to said retractor shaft; and

a pawl pivotally coupled to said eccentric portion of said rotor plate and slideably disposed on said inertial plate in a substantially radial direction of movement, such that when said rotor plate and inertial plate are rotatively displaced with respect to each other, said pawl moves pivotally and radially relative to said rotor plate and engages said ratchet ring and locking means responsive to rotation of said ratchet ring for locking said shaft in a belt withdrawal direction.

4,135,683
SAFETY BELT RETRACTOR HAVING TWO REELS IN A COMMON HOUSING

Robert L. Stephenson, Sterling Heights; James Gavagan, Center Line, both of Mich., and Yogendra S. Loomba, Knoxville, Tenn., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 21, 1977, Ser. No. 817,636
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **16 Claims**

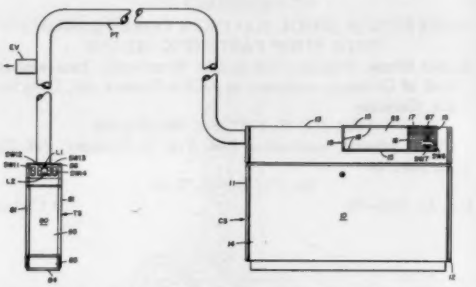
1. A vehicle safety belt retractor apparatus, comprising:
a housing;
first and second spools journalled in said housing for storing, respectively, first and second safety belts in helical wrap, each of said belts adapted to be manually withdrawn from said housing;
spring means for biasing said spools toward a fully wound condition;
first and second ratchet wheels secured, respectively, to said spools;
a single pawl positioned between said first and second ratchet wheels and having opposite ends operative to engage said ratchet wheels; means for supporting said pawl inside said housing about a floating pivot point which permits pivotal and linear shifting motion of said pawl;
an inertia device responsive to acceleration of a vehicle carrying said housing to pivot said pawl into engagement with said first ratchet wheel; and whereby said pawl is shifted by limited rotation of said first ratchet wheel into engagement with said second ratchet wheel, thereby positively locking both of said spools against rotation.

4,135,684
SINGLE TUBE PNEUMATIC BANKING SYSTEM

Clair L. Willey, Marion, Iowa, assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Aug. 17, 1977, Ser. No. 825,283
Int. Cl.[2] B65G *51/32*
U.S. Cl. 243—19 **13 Claims**

1. In a pneumatic tube system for drive-up banking and the like, the system including a tube interconnecting bank teller and customer stations for pneumatically transporting a generally cylindrical carrier through the tube in either direction between the two stations, the customer station including blower means, the improvement wherein the customer station comprises: a generally tubular customer carrier receiver assembly having opposite ends and disposed in a generally horizontal position, a first one of said ends being connected to one end of the tube in order to receive a carrier from and to send a carrier through the tube, the second of said ends forming a carrier stop and connected to the blower means, the blower means being effective to alternately supply air to or exhaust air from the customer receiver assembly; the receiver assembly adjacent said second end having a stationary portion and a portion carried by and horizontally slidable on the stationary portion in opposite axial directions with respect to the stationary portion between open and closed positions, one of said portions carrying said second receiver assembly end and providing a customer carrier receptacle permitting a carrier to be inserted in and removed from the customer receiver assembly when said movable portion is in its open position, the other of

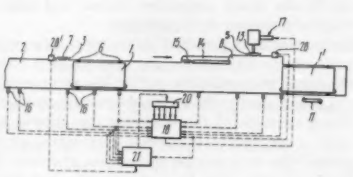


said portions providing a customer carrier receptacle closure when said movable portion is in its closed position effective to close the customer receiver assembly so that the blower means can move a carrier through the tube from one of the customer and teller stations to the other; and customer receptacle closure operating means having a first stage responsive to the arrival of a carrier in the customer receptacle to automatically move said movable portion to its open position for removal of the carrier.

4,135,685
DEVICE FOR BRAKING CONTAINERS OF PNEUMATIC TUBE TRANSPORT INSTALLATIONS

Igor I. Girshovich; Vadim Y. Pripadchev; Vladimir Tsernes; Valery I. Bagryantsev; Valery V. Berdnik; Naum Y. Kershenbaum; Jury B. Petrakov; Semen M. Zelvinsky, and Tatyana D. Yastrebova, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Po Truboprovodnym Konteinernym Sistemam, Moscow, U.S.S.R.

Filed Sep. 1, 1977, Ser. No. 829,889
Int. Cl.[2] B65G *51/20*
U.S. Cl. 243—38 **6 Claims**



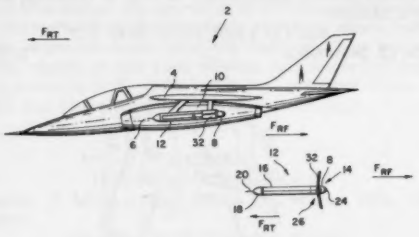
1. A device for braking containers in a braking zone of a tube of a pneumatic tube transport installation, said containers having sealing skirts, comprising: an opening defined in a portion of the wall of the tube defining the braking zone for the discharge of propelling air; a tube plug located after said air discharge opening in the direction of container movement for closing said tube of the pneumatic tube transport installation so that air compressed between the skirt of the container and said tube plug brakes the container; a flow restricting opening for letting out air compressed between the tube plug and the container skirt; a plurality of auxiliary flow restricting openings positioned in the tube between the flow restricting opening for letting out the compressed air and the opening for the discharge of the propelling air; and a safety bypass valve located in the braking zone and operating when pressure in the tube between the plug and the container is higher than that causing a maximum permissible acceleration of the container.

4,135,686

DEVICE FOR STARTING ROCKET-DRIVEN MISSILES

Eugen Herpfer, Markdorf, Germany, assignor to Dornier GmbH, Germany

Filed Oct. 8, 1975, Ser. No. 620,797
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1974, 2452053
Int. Cl.[2] F42B *13/32*
U.S. Cl. 244—3.27 3 Claims



1. A device for starting a rocket-driven missile whose flight course is directed opposite the flight course of a carrier aircraft, which comprises aerodynamically-acting, concentrically-mounted, braking means mounted on receiving container means for said rocket-driven missile,

said braking means being mounted on said container means in the area of the tip of a missile contained therein, and being adapted to be extended from a position of low resistance to a position of higher resistance,

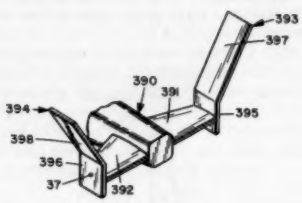
and means for detaching said container means together with said rocket-driven missile from said carrier aircraft.

4,135,687

STEERING AND STABILIZATION APPARATUS FOR AIRCRAFT

Allen Jones, Jr., 5028 Lauderdale Ave., Virginia Beach, Va. 23455

Continuation-in-part of Ser. No. 661,626, Feb. 26, 1976, Pat. No. 4,040,373, which is a continuation-in-part of Ser. No. 579,896, May 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 566,353, Apr. 9, 1975, Pat. No. 3,995,575, which is a continuation-in-part of Ser. No. 279,714, Aug. 10, 1972, Pat. No. 3,881,438. This application Aug. 5, 1977, Ser. No. 822,227
Int. Cl.[2] B64C *5/10, 9/00*
U.S. Cl. 244—90 R 4 Claims



1. An airplane, comprising:

an elongated fuselage carrying substantially forwardly positioned airfoil means capable of providing lift forces for sustaining said airplane in flight;

a pair of elongated vane members positioned alongside said fuselage adjacent the rearward end thereof having substantially planar outer end regions projecting away from said fuselage and having inner end regions nearer said fuselage than said outer end regions thereof; and

mounting means mounting said inner end regions on said fuselage for rotary movement about a substantially horizontal common axis substantially perpendicularly disposed with respect to the plane of symmetry of said airplane;

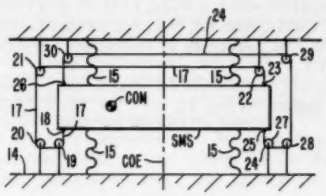
said substantially planar outer end region of each of said vane members extending in a plane which obliquely intersects said common axis, each of said vane members being rotatable about said common axis and thereby rotatably movable into and out of alignment with the airstream passing rearwardly alongside said fuselage when said airplane is moving forwardly to concurrently serve steering and banking functions.

4,135,688

ANTI-TILTING RESILIENT SUPPORT SYSTEM FOR AIMED AIRBORNE POD-ENCLOSED SENSOR INSTRUMENTS

Forrest E. England, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1977, Ser. No. 800,663
Int. Cl.[2] F16F *7/00, 9/346*
U.S. Cl. 248—604 3 Claims



1. An anti-tilting resilient support system for airborne optical sensor instruments, comprising:

a supporting structure for mounting on an aircraft,

a sensor mounting structure having an input optics portion for observation of optical information along a line of sight,

resilient support means interposed between said supporting structure and said sensor mounting structure,

a plurality of taut cables anchored at their opposite ends to longitudinally spaced apart points on said sensor mounting structure, and

a plurality of pulleys on said supporting structure directing movement of each of said cables along a pathway having four right-angled bends for directing movement of ends of each cable in opposite directions,

said cables and pulleys being so constructed and arranged as to oppose longitudinal tilting of said sensor mounting structure relative to said supporting structure.

4,135,689

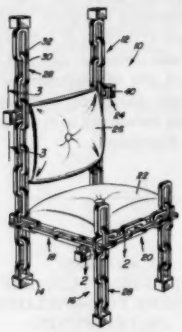
RIGID CHAIN SYSTEM FOR CONSTRUCTING ARTICLES

Marvin P. Lanphear, 938 S. Second St., Pocatello, Id. 83201

Filed Sep. 25, 1975, Ser. No. 616,878
Int. Cl.[2] F16M *11/20*
U.S. Cl. 248—188.1 11 Claims

1. In a load supporting article having a horizontal element interconnected between at least two rigid vertical columns, each of said columns constituted by a single unitary piece of material having a plurality of chain-like link sections, adjacent ones of the link sections being aligned with perpendicular planes intersecting along a common column axis, each of the

link sections having spaced leg portions interconnected at opposite longitudinal ends by bridging portions, the bridging



portions of the adjacent link sections being integral with each other.

4,135,690

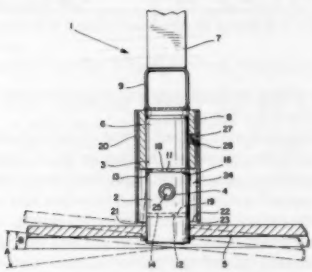
ADJUSTABLE ANGLE FLOOR SUPPORT

Samuel C. Clarke, Andover, N.J., and Edward Losinski, Michigan City, Ind., assignors to InterRoyal Corporation, New York, N.Y.

Continuation of Ser. No. 673,247, Apr. 2, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,765

Int. Cl.[2] F16M *11/20*

U.S. Cl. 248—188.2 **13 Claims**



1. Adjustable angle plumb and level floor support for free standing portable room divider panels comprising:

a lower load bearing leg section having an upwardly directed end portion provided with a laterally directed load bearing engagement face and adapted to be mounted on a floor engaging foot,

an upper load transmitting leg section having a downwardly directed end portion provided with a cooperating laterally directed load transmitting engagement face and adapted to receive in load bearing relation thereon a portable room divider panel,

releasable positioning means adjustably operatively interpositioning about an axis of pivot said upper leg section on said lower leg section in partial overlapping relation at said faces and with said faces in opposed lateral direct load bearing releasable interengaging contact substantially along their common extent and with the remainder of said end portions operatively spaced from each other and disposed out of direct load bearing contact with each other, for relative angular displacement between said leg sections about said axis at said faces for plumb and level adjustment, and

a longitudinal impingement sleeve positioned in captively enclosing selectively spaced operative relation with respect to said leg sections for impingement to limit selectively the range of relative angular displacement between said leg sections.

4,135,691

FOLDING LEG ASSEMBLY

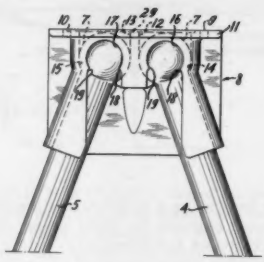
Herbert L. Wiesmann, Ohmstr. 28, 5620 Velbert 1, Fed. Rep. of Germany

Filed Aug. 16, 1977, Ser. No. 825,090

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1976, 2633388

Int. Cl.[2] F16M *11/38;* **A47B** *3/00*

U.S. Cl. 248—188.6 **29 Claims**



1. A folding leg assembly including a leg, having a ball at one end thereof; a trestle, having a socket for receiving the ball of the leg in such a manner that the leg can swing from an extended position to a folded position and a guide slit communicating with the socket for defining the path of swing when the leg is swung from its extended position to its folded position; and a trough-like member depending lengthwise from the trestle and partially embracing the socket, the laterally inner surface of the trough-like member having a shape which matches the shape of a portion of the laterally outer surface of the leg over an extended substantially continuous longitudinal length of the leg and being contiguous with the matching portion of the laterally outer surface of the leg when it is in its extended position, whereby the trough-like member braces the leg against inadvertent movement in a generally lateral direction when the leg is in its extended position.

4,135,692

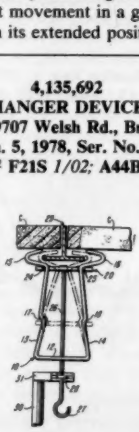
HANGER DEVICE

William J. Ferguson, 9707 Welsh Rd., Brookville, Ohio 45309

Filed Jan. 5, 1978, Ser. No. 867,046

Int. Cl.[2] F21S *1/02;* **A44B** *21/00*

U.S. Cl. 248—317 **10 Claims**



1. A hanger or like device for quick attachment to and release from a support structure including a U-shaped member comprised of a base and relatively projected arms, the projected extremities of the latter of which provide opposing cup-shaped anchoring means, said arms being flexible with respect to said base to provide for relative separating and approaching motions of said anchoring means, a plate element

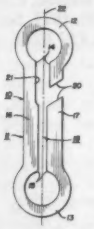
having slots through which said arms are projected, said plate element being movable longitudinally along said arms toward and away from said projected extremities thereof, said arms in extending through said slots in said plate element assuming a convergent relation to one another whereby a motion of said plate element toward said projected extremities effects a separating motion of said cup-shaped anchoring means and a motion of said plate element away from said projected extremities effects an approaching motion of said cup-shaped anchoring means, said U-shaped member defining a clamp opened and closed with respect to a support structure by a relative separating and approaching motion of said anchoring means, and an article suspension means extending from said clamp in a connected relation to said plate element, said suspension means being accessible to be pulled and pushed to fix said clamp and to free said clamp relative to the support structure.

4,135,693

DOUBLE HOOK HANGER

Frederick J. Miavitz, 7040 Shaner Dr., Walton Hills, Ohio 44146

Filed May 3, 1977, Ser. No. 793,238
Int. Cl.[2] F16B *45/00*; B42F *13/00*
U.S. Cl. 248—339 **5 Claims**



1. A one-piece hanger comprising an integral strip shaped into a configuration including opposed circular ends of substantially equal diameter defining hook means, said ends being connected by separated, substantially parallel lengths of said strip, said lengths being separated a substantially equal distance from one circular end to the other, said distance being less than the diameter of a circular end and forming an access area between said lengths and communicating with at least one of said circular ends, the terminals of said integral strip being spaced apart to form a permanently open gap lying between said opposed circular ends and forming a continuation of one of said connecting lengths of the strip, said gap defining an entrance and exit to said access area, a section of one of said lengths adjacent a circular end having a smaller width than a corresponding section of the other parallel length adjacent the same circular end to provide an enlarged access area between said corresponding sections, whereby an article to be supported by the hanger may be placed in or withdrawn from said access alley and thereby placed in or withdrawn from a circular end, and said permanently open gap being relatively small to prevent accidental release of such article.

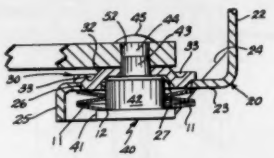
4,135,694

PIVOT SUPPORT BRACKET

Philip D. Stegenga, and Wayne Vandenbrink, both of West Olive, Mich., assignors to Donnelly Mirrors, Inc., Holland, Mich.

Filed May 16, 1977, Ser. No. 797,022
Int. Cl.[2] B60R *1/02*
U.S. Cl. 248—478 **21 Claims**

7. A pivot support for mounting a mirror bracket or the like to a vehicle comprising a base with a base aperture therethrough; attaching means for securing said base to a vehicle body or the like; an axle extending through said base aperture and rotatable therein; separately formed rotation means secured to said axle such that they are rotatable in unison with said axle for engaging said base, said rotation means including one surface engaging said base and another surface opposite said one surface for supporting a mirror bracket or the like when secured on said axle; said base and rotation means including cooperating detent means for retaining said base and rotation means in a predetermined rotational position with respect to one another; means for biasing said rotation means toward and into engagement with said base and for maintaining engagement of said detent means when one end of said axle is secured to a mirror bracket or other member to be pivotally supported; and flange means integral with and extending from said base and toward the other end of said axle for at least partially covering said axle and biasing means and strengthening and rigidifying said base;



said means for biasing said rotation means including at least one spring coupled between the ends of said axle; and

said axle having permanently deformed ends which are rotationally and longitudinally fixed relative to one another, for securing therebetween said spring, said rotation means, said base, and said mirror bracket or other member to be pivotally supported, and for applying a predetermined, fixed force to said spring thereby biasing said rotation means toward and into engagement with said base;

said rotation means being a plate member including a central opening having anti-rotation means for preventing rotation of said axle therein; and

at least one protrusion in a direction generally perpendicular to a major face of said plate member for acting as part of said detent means.

4,135,695

MOLDING MACHINE MORE PARTICULARLY FOR THE MANUFACTURE OF SQUARE-SHAPED CONSTRUCTION ELEMENTS

Claudio Capdevila, Calle Ramon Albo, 72-74, esclo. izquierda, 1 3a, Barcelona 16, Spain; François A. Juan, 52, rue Yves Farges, Grigny (Rhône), France; Gaëtan Venditti, 10, rue Frères Benoit, Oullins (Rhône), France, and Michel E. L. Alquier, 10, rue Meyer, Mazamet (Tarn), France

Filed Mar. 8, 1977, Ser. No. 775,529
Claims priority, application France, Mar. 8, 1976, 76 07399
Int. Cl.[2] B28B *7/26*
U.S. Cl. 249—118 **9 Claims**

1. A molding machine for the production of polygonal structural elements, comprising:

a support having a pair of mutually spaced end members;

a pair of elongated mutually parallel rectangular horizontal bottom plates disposed between said end members each adapted to define the bottom of a respective mold cavity having the configuration of the structural elements, said bottom plates having ends along narrow sides of the respective rectangles;

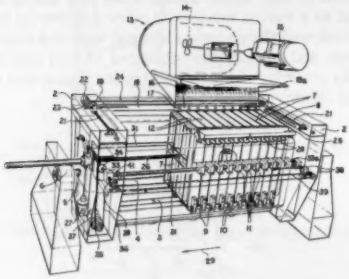
respective rectangular vertical plates disposed between said end members and defining opposite walls of adjacent mold cavities, one of said vertical plates serving as a common member separating said mold cavities from one another;

jack means on one of said end members and connected to the vertical plate proximal thereto for displacing said vertical plates relative to said members from a molding position, wherein the vertical plates of each mold cavity are spaced

apart by a distance corresponding to the width of the respective bottom plate into a release position in which elements molded in said cavities can be discharged, said vertical plates having increased spacing from one another in said release position;

means for connecting one of the vertical plates of each mold cavity to the respective bottom plate thereof;

respective lateral gates hingedly connected to each of said ends of each of said bottom plates and swingable between



closed positions wherein said lateral gates are spread away from edges of the element formed in the respective mold cavity;

shiftable respective bars extending between said members and connected to the lateral gates of the mold cavities; and

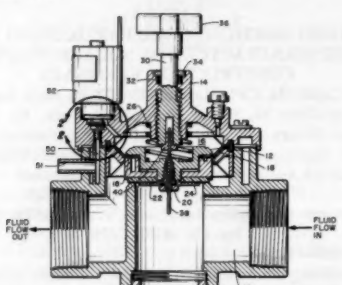
means on said end members for shifting said bars to displace said gates between said mold position and said release position, and each of said bars being guided in said end members by respective grooves for arcuate movement.

4,135,696

PILOT OPERATED DIAPHRAGM VALVE

Myrl J. Saarem, Carson City, Nev., and Dale F. Soukup, Meadow Vista, Calif., assignors to Richdel, Inc., Carson City, Nev.

Filed Nov. 1, 1976, Ser. No. 737,673
Int. Cl.[2] F16K *31/385, 31/40*
U.S. Cl. 251—30 **1 Claim**



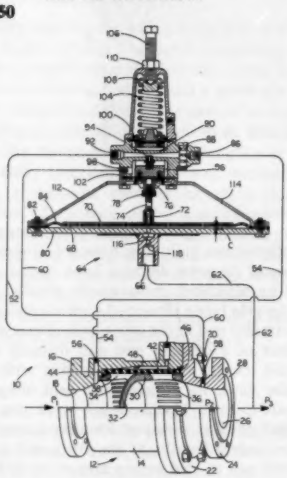
1. A valve assembly for controlling liquid flow, said valve assembly including: a casing defining an inlet and an outlet, and also defining a valve chamber, an auxiliary chamber, and a conduit interconnecting the valve chamber and the auxiliary chamber, said auxiliary chamber having a discharge port for discharging liquid from said valve chamber and from said auxiliary chamber; means defining a bleed port for introducing liquid into said valve chamber; a valve actuator movable in said valve chamber between a first position in which the valve defines an open path between said inlet and said outlet, and a second position in which the valve closes said path; a diaphragm supporting said valve actuator in said valve chamber and providing a seal for said valve chamber; a solenoid operated valve positioned in said auxiliary chamber and including a plunger extending into said discharge port to permit the discharge from the valve chamber when the pilot valve is in an open position so that there is insufficient pressure exerted on the valve actuator to hold the valve actuator in its second position thereby normally to establish the valve actuator in its first position; a valve seat positioned in said discharge port, and said plunger having a distal end positioned to seat against said valve seat when the pilot valve is closed, said pilot valve serving to block the flow of liquid through said discharge port when closed so as to cause a pressure build-up in said valve chamber causing said valve actuator to move to its second position; and an outlet line coupled to said discharge port and to the inlet of a pump to discharge liquid from the discharge port to a point independent of said valve outlet so as to establish a material pressure differential across the diaphragm independent of pressure differentials in the liquid flow through the valve so as to obviate instability at low flow rates.

4,135,697

LOW PRESSURE PILOT VALVE

Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed May 31, 1977, Ser. No. 802,017
Int. Cl.[2] F16K *31/12*
U.S. Cl. 251—50 **4 Claims**



1. A pressure regulator valve comprising:

a valve body having a flow passageway therethrough;

a valve port in said flow passageway;

a valve closure member reciprocable into and out of sealing engagement with said valve port;

adjustable biasing means urging said valve closure member away from said sealing engagement;

a cover plate of large area secured to said valve body;

a stem on said valve closure member;

a diaphragm of large area carried on said stem in closely spaced, parallel relationship to said cover plate;

said diaphragm being sealed around the periphery thereof to said cover plate to form a pressure chamber therewith whereby fluid pressure acts against one side of said diaphragm in opposition to said biasing means;

the other side of said diaphragm being exposed to atmospheric pressure; and

a sensing port through said cover plate adapted for connection to a pipeline for sensing pressure therein;

a restricted orifice in said sensing port;

means on said stem for adjusting the clearance between said diaphragm and said cover plate.

4,135,698

SEALING DEVICE

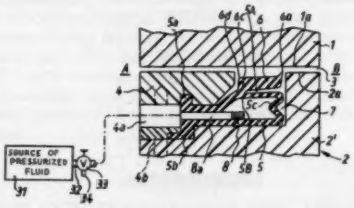
Kurt Thate, and Konrad Brückl, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,539

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606813

Int. Cl.[2] F16K *7/10*

U.S. Cl. 251—61.1 **16 Claims**



1. A device for sealing a gap between a first space and a second space wherein the pressure exceeds, at least at times, the pressure in said first space, comprising first and second members respectively having first and second surfaces disposed at the opposite sides of and flanking said gap, the surfaces of one of said members having a recess extending substantially transversely of said gap; a seal mounted in said recess and including a deformable first section having a first side facing said gap and a second side located opposite said first side, a second section movably installed between said first section and the other of said members and having first and second portions respectively disposed nearer to said first and second spaces, and means for securing said second section to said one member so as to enable at least said second portion to move toward and away from said other member; a source of pressurized fluid; and means for admitting fluid from said source against said second side of said first section to thereby move said first side toward said gap and to thus effect the movement of at least said second portion of said second section into sealing engagement with the surface of said other member, said second section having a side facing away from said gap and being exposed to pressure in said second space in response to admission of pressurized fluid against said second side of said first section so that the pressure which is applied against said side of said second section maintains said second portion of said second section in sealing engagement with the surface of said other member as long as the pressure in said second space exceeds the pressure in said first space and regardless of whether or not pressurized fluid is evacuated from said second side of said first section subsequent to movement of said second section into sealing engagement with said other member.

4,135,699

CONTROL VALVE FOR GASEOUS AND LIQUID MEDIA

Lothar Petzsch, and Alfred Rentel, both of Bad Kreuznach, Fed. Rep. of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

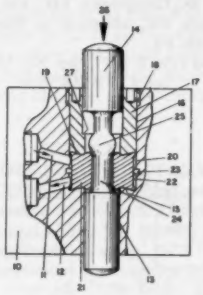
Filed Apr. 25, 1977, Ser. No. 790,578

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617721

Int. Cl.[2] F16K *7/02*

U.S. Cl. 251—320 **12 Claims**

1. A control valve for fluid media consumable as nourishment especially beverages filled into containers by machine operation which includes in combination: housing means with a bore having a widened chamber section intermediate its ends, inlet and outlet conduit means arranged in said housing means and leading into and out of said widened chamber section for conveying the fluid medium to be controlled, elastically acting diaphragm means arranged in said widened chamber section and having an outer peripheral portion movable radially outwardly with regard to the bore of said housing means from a connecting position in which said peripheral portion is spaced from said inlet and outlet conduit means so as to permit communication between said inlet and outlet conduit means to a closing position in which said peripheral portion prevents communication between said inlet and outlet conduit means,



said diaphragm means being provided with a bore extending in the axial direction of the bore of said housing means, a valve pin actuatable from two sides as reciprocably mounted in said bore of said housing means and having a section extending through the bore of said diaphragm means, said valve pin section having two different diameter portions selectively movable into and out of said bore of said diaphragm means for selectively moving said diaphragm means into a first position for interrupting fluid communication between said inlet and outlet conduit means or into a second position for establishing communication between said inlet and outlet conduit means.

4,135,700

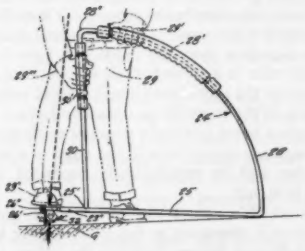
LAWN WEEDER

Samuel H. Arzoian, 942 Washington St., Portland, Me. 04101

Filed May 30, 1978, Ser. No. 910,455

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—132 **13 Claims**



1. A lawn weeder comprising an elongated bottom lever arm portion, a weed lifting prong secured to one end of the lever portion and extending downwardly therefrom to penetrate the ground beneath a weed root upon the application of foot pressure of the user upon the lever arm above the prong, a curved handle portion extending upwardly and forwardly from the opposite end of the lever arm portion to a height near to the waist of the user and within easy reach of his hands and a vertically-extending strut portion depending from the upper end of the curved handle portion and aligned with the one end of the lever portion rearwardly of the prong a sufficient dis-

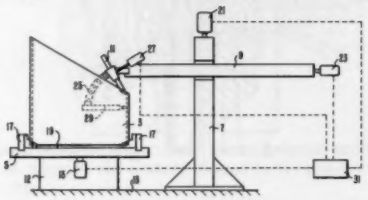
tance to allow for easy application of the foot to the forward side of the strut portion, the action for the lifting of the weed being effected when the curved handle portion is grasped and passed laterally across the body of the user adjacent his waist and without bending his back, all said portions including the prong being substantially the same vertical plane and generally shaped as a quadrant.

4,135,701

AUTOMATIC FLAME CUTTER FOR MITRES WITH CONSTANT ANGLE BEVELS ON A PIPE

Stanley C. Light, Jr., Georgetown, Tex., and Louis J. Privoznik, Newtown Square, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 2, 1977, Ser. No. 765,030
Int. Cl.[2] B23K *7/04*
U.S. Cl. 266—57 **1 Claim**



1. Automatic flame-cutting apparatus for producing on pipe, mitres having a constant angle bevel, said apparatus comprising:

a turntable disposed to rotate at varying speeds about a generally vertical axis and having an imaginary plane generally disposed perpendicular to the axis of rotation;

means for clamping said pipe on said turntable so that said pipe is disposed with its longitudinal axis generally coaxial with the axis of rotation of said turntable;

a boom synchronized with the rotation of said turntable and having an imaginary line disposed thereon generally parallel to said imaginary plane on said turntable, the synchronization being such that the distance between the imaginary line on said boom and the imaginary plane on said turntable varies in such a manner as to provide a predetermined distance therebetween for each angular position of the turntable;

a cutting torch mounted on an arcuate slide attached to said boom, the cutting torch being generally fixed relative to the boom and outside the pipe to cut a uniform mitre on said pipe in a first mode of operation, and the cutting torch being movably mounted inside the pipe to follow the arcuate slide in a second mode of operation, the arcuate position of the torch being synchronized with the angular position of the turntable in the second mode of operation whereby a bevel forming a constant angle with respect to an imaginary plane through the edge of a mitred cut on the pipe will be automatically produced utilizing said apparatus; and,

a probe which contacts the inside of the pipe when the apparatus is operating in the second mode to maintain a predetermined distance between the cutting torch and the inner surface of the pipe.

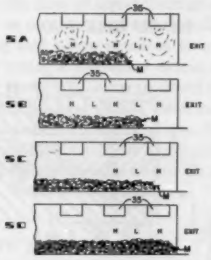
4,135,702

METHOD AND APPARATUS FOR PREHEATING SCRAP

Henry J. Venetta, Warren; Raymond E. Singrey, Williamsfield, and John E. Coughlin, Youngstown, all of Ohio, assignors to Venetta, Inc., Warren, Ohio

Filed Oct. 29, 1976, Ser. No. 737,039
Int. Cl.[2] F27D *3/00*
U.S. Cl. 266—44 **5 Claims**

1. In a metal batch preheating method wherein a tunnel furnace, and a heat resistant conveyor positioned in and extending through the furnace for carrying metal to be heated are provided, which furnace has longitudinally spaced transversely extending zones of greater heat intensity than areas intermediate said zones, and including the steps of loading the conveyor with a metal mass for the length of the tunnel furnace except for at least a portion of the last greater intensity heat zone, terminating the conveyor drive, heating the metal mass with some longitudinally spaced areas thereof being made hotter than adjacent areas, again driving the conveyor to move



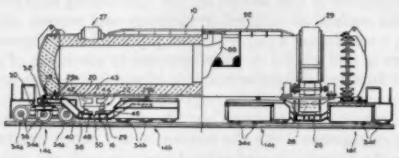
its contents a fraction of the remaining unloaded length of the furnace, terminating the conveyor drive and heating as before, again driving the conveyor to move its contents another fraction of the unloaded furnace length, stopping the conveyor and heating, supplying fresh secondary air directly to the bottom portions of the metal mass being heated to aid in burning off any combustible adhering thereto, and discharging the heated metal mass after the metal mass has been subjected to several short advance, stop and heat cycles.

4,135,703

MOBILE HOT METAL MIXER

Rashed N. Nagati, Mars; Howard M. Fisher, and John W. Mrozek, both of New Castle, all of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jul. 25, 1977, Ser. No. 818,673
Int. Cl.[2] C21C *7/00*
U.S. Cl. 266—165 **6 Claims**



1. An elongate vessel for containing a molten metal charge, first and second pairs of truck means disposed respectively at the opposite ends of the vessel for supporting the same, said vessel bridging the gap between said pairs of truck means and interconnecting the same,

each pair of truck means including a first truck means disposed at one side of said vessel and having pairs of wheels adopted to engage a first set of parallel rails and a second truck means disposed at the opposite side of said vessel and having pairs of wheels adapted to engage a second set of parallel rails disposed adjacent said first set and being oriented relatively parallel with respect thereto,

cross beam means interconnecting said first and second truck means of each pair,

vessel rotating means being disposed on each of said cross beam means,

a first bearing means disposed between each of the first truck means of each pair and one end of each said cross beam means and a second bearing means disposed between the

opposite end of each cross beam means and its associated second truck means,

each of said first bearing means include first and second members, each said first members being affixed to its associated cross beam means and each said second bearing members being affixed to its associated first truck means, one of said first and second bearing members having a concave surface and the other a complimentary convex surface which permits universal pivotal movement between each first truck means and its respective cross beam means,

each said second bearing means including third and fourth bearing members, one of said third and fourth bearing members having a concave surface and the other having a complimentary convex surface to permit relative universal pivotal movement therebetween, said third bearing members being mounted on their respective second truck means, and roller bearing means disposed between each said fourth bearing means members and the other end of its associated cross beam means to permit limited relative lateral movement between each said first and second truck means.

4,135,704

METHOD AND APPARATUS FOR HEAT TREATMENT OF MATERIAL TO BE WORKED ON, ESPECIALLY OF ALUMINUM ALLOYS OR MAGNESIUM ALLOYS

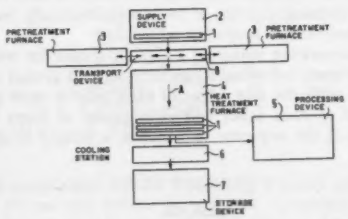
Friedrich W. Elhaus, Jägerhofstrasse 117, D-56 Wuppertal 1, Fed. Rep. of Germany, and Bernhard Hilge, Adliswil, Switzerland, assignors to Prolizenz AG. and Friedrich Wilhelm Elhaus, both of Chur, Switzerland

Continuation-in-part of Ser. No. 417,509, Nov. 20, 1973, Pat. No. 3,953,247. This application Mar. 22, 1976, Ser. No. 669,347

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1972, 2256978; Oct. 3, 1973, 2349765

Int. Cl.[2] C21D *1/08*

U.S. Cl. 266—261 **14 Claims**



1. Apparatus for heat treatment of a metal piece or metal pieces to be subsequently worked on, such as ingots, billets, rods, tubes, cast strips and cast billets, especially of aluminum or magnesium alloys, wherein the pieces are pre-heated and therafter held at a predetermined heat treatment temperature for a predetermined time,

comprising in combination:

a pretreatment furnace including a heating device having flame producing burners and being operable to heat the pieces at a pretreatment temperature higher than the heat treatment temperature; using direct flame impingement against the separated pieces;

a heat treatment furnace including heating means for providing hot gases and forced circulation of the hot gases, said heating means having a temperature control device for adjusting and maintaining the temperature of the hot gases; and

transport means comprising a pretreatment transport device and a treatment transport device mounted in the heat treatment furnace, said pretreatment transport device being operable to move the pieces at a pretreatment speed through said pretreatment furnace and said treatment transport device being operable to move the pieces at a treatment speed through said heat treatment furnace; said treatment speed and said pretreatment speed being independently variable and including stop-and-go, stepwise motion, and continuous motion means, each of the pieces having a longitudinal axis and being transportable in a transport direction through the heat treatment furnace under partial, controlled rotation about the longitudinal axis, the transport device comprising a stationary base with saw-tooth-like depressions having surfaces slightly slanted in the transport direction for receiving the pieces; and lifting members drivable in a lifting direction and independently thereof in the transport direction, by means of which the pieces are lifted from a depression and in a controlled manner set down on the oblique surface of the depression due to their own weight under braking contact of one of the lifting members, the latter being lowerable against the lifting direction in a controlled manner.

4,135,705

TAPHOLE SEALING APPARATUS

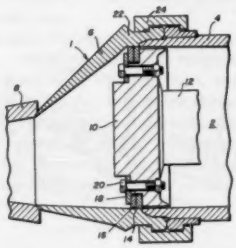
Pierre H. Mailliet, Howald, Luxembourg, assignor to S.A. des Anciens Etablissements Paul Wurth, Luxembourg

Continuation-in-part of Ser. No. 705,680, Jul. 15, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,211

Claims priority, application Luxembourg, Jul. 24, 1975, 75045

Int. Cl.[2] C21B *7/12*

U.S. Cl. 266—273 **12 Claims**



1. In apparatus for closing tapholes in a blast furnace by means of injection of a sealing compound into such holes, the taphole closing apparatus being intended for operation by a hydraulic actuator having two operative states respectively commensurate with the actuator piston being fully extended and fully retracted, the improvement comprising:

means defining a taphole sealing compound receiving cylinder, the sealing compound receiving cylinder having first and second oppositely disposed ends;

ejector piston means disposed for movement within said sealing compound receiving cylinder only between first and second positions, said piston means including a piston and at least a first peripheral sealing member mounted thereon, said first sealing member cooperating with the inside of said cylinder to prevent leakage of sealing compound past the piston;

piston rod means extending into said sealing compound receiving cylinder through the first end thereof, said rod means coupling said ejector piston means piston to the actuator piston whereby the actuator controls the movements of said ejector piston means piston between said first and second positions;

a tubular taphole engaging nose through which the sealing compound is expelled from the apparatus;

tubular cylinder extension means for providing fluid communication between said sealing compound receiving cylinder defining means second end and said nose, said extension means including a first portion dimensioned so as to receive at least a portion of said ejector piston means including the first sealing member mounted thereon, the

first position of said piston means piston corresponding to the actuator piston being in its fully extended position and placing said portion of said piston means piston within said extension means, at least a portion of the sealing member being located in the extension means when the piston means is in the first position, whereby removal of said extension means from said cylinder defining means affords unobstructed access in the radial direction to said piston means for servicing thereof with said piston means actuated to said first position, said extension means also including a second portion which defines a passage extending from said first portion to said nose; and

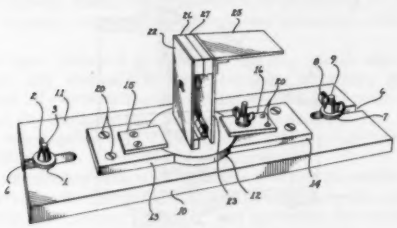
collar means, said collar means engaging the exterior of said sealing compound receiving cylinder defining means and said extension means to rigidly and detachably hold said extension means with the first portion thereof in axial alignment with said cylinder defining means cylinder.

4,135,706

WORKPIECE HOLDING ASSEMBLY

Donate Butticci, deceased, late of Phoenix, Ariz., and Donald E. Butticci, personal representative, 2319 W. Columbine, Phoenix, Ariz. 85020

Filed Oct. 26, 1977, Ser. No. 845,529
Int. Cl.[2] B23Q *1/04*
U.S. Cl. 269—82 **6 Claims**



1. A workpiece holding assembly adapted for an operator having one useful arm which comprises:

a. a mounting base having first and second opposing surfaces;

b. a turntable rotatably mounted on the first surface of said base;

c. engaging means mounted on the second surface of said base for locking said turntable in a fixed position; said engaging means comprising a support plate mounted on the first surface of said base spaced adjacent to the turntable; an engaging plate mounted on said support plate for contacting the turntable to prevent rotation thereof; and means for activating said engaging plate and thereby position the workpiece on said assembly;

d. first and second workpiece retainers mounted on the turntable, said first retainer being mounted in a fixed position, said second retainer being mounted in a movable position to permit insertion of a workpiece therebetween; said first and second workpiece retainers being substantially parallel and extending in a substantially perpendicular direction from the turntable, and further comprising hinge means for coupling the second retainer to the turntable.

e. biasing means coupled to the second retainer for urging said first and second retainers in closed position; and

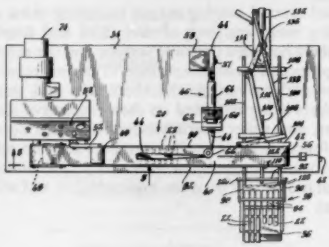
f. a flange affixed to the second retainer and spaced from the turntable, said flange receiving the arm of the operator and thereby permitting insertion of the workpiece between the first and second retainers by said operator.

4,135,707

APPARATUS AND METHOD FOR COLLATING AND BUNDLING BELT LOOPS

Louis W. Breck, Jr., El Paso, Tex., assignor to Billy the Kid, Inc., El Paso, Tex.

Division of Ser. No. 741,044, Nov. 11, 1976, abandoned. This application May 19, 1977, Ser. No. 798,305
Int. Cl.[2] B65H *39/00*
U.S. Cl. 270—52 **9 Claims**



1. Apparatus for collating and bundling belt loops in the order in which they are cut from a fabric lay comprising:

conveyor means having a longitudinal axis extending in the direction of its travel,

means for driving said conveyor means,

means for simultaneously feeding and depositing on said conveyor means transverse to the longitudinal axis of said conveyor means individual belt loops from a plurality of chains of belt loops sewn together by connecting threads along spaced lines parallel to side edges of each loop, the loops which are deposited simultaneously forming a group of loops cut from the same area of a fabric lay,

cutting means for simultaneously severing the connecting threads between the individual belt loops in each of said chains forming a group of loops simultaneously fed and deposited on said conveyor means, and

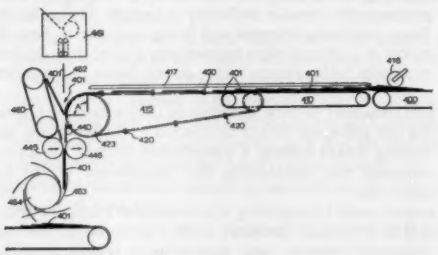
means cooperating with said conveyor means for winding said severed individual loops forming said groups into a bundle with the side edges of each loop in each group parallel to each other and each group of loops being wound in the sequence in which it is formed from said chains.

4,135,708

HIGH SPEED INSERT HANDLING MECHANISM AND METHOD

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Division of Ser. No. 688,538, May 21, 1976. This application Feb. 2, 1977, Ser. No. 765,064
Int. Cl.[2] B65H *5/30*
U.S. Cl. 270—57 **5 Claims**



1. Conveying apparatus for opening papers folded over to present at least two pages for stuffing of inserts between the

pages, which papers are shingled on a conveyor and conveyed fold edge forward with pages trailing, comprising in combination:

means for un-shingling said papers by increasing the surface speed of travel thereof;

means for gripping each paper by clamping at the trailing edge only a part of the pages against the conveyor;

opener means for opening the pages of each paper not gripped by the gripping means away from those pages gripped by the gripping means;

said opener means comprising a vacuum distributing drum having means for communicating a vacuum to a portion of the surface of said drum for retaining over that sector the paper thereagainst, and rotating at a surface speed and having a diameter such that as the drum rotates the ungripped pages of said paper are opened by centrifugal force and some of the pages are able to flop over;

means for closing the pages opened by said opener means; and

means re-shingling said papers having their pages closed.

4,135,709

DEVICE FOR PREVENTING THE REVERSE MOVEMENT OF A ROTARY CYLINDER USED IN A PAPER SHEET COUNTER

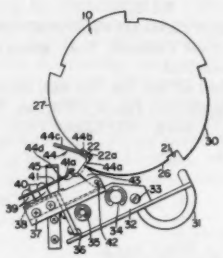
Shinya Uchida; Sinai Moriyama, and Minoru Yoshida, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,608

Claims priority, application Japan, Dec. 15, 1976, 51-150603

Int. Cl.[2] B65H *3/12*

U.S. Cl. 271—95 **3 Claims**



1. A paper sheet counter comprising a rotary cylinder provided on one end surface thereof with a plurality of suction shafts for sequentially sucking and deflecting sheets of paper one at a time and having on its peripheral wall a plurality of grooves provided alternately with a plurality of cam projections, and stopper means pivotably mounted to cause a stopper thereof to engage with one of said grooves when the rotary cylinder is not actuated, characterized in that the stopper means is provided with auxiliary stopper means for engaging with another one of said grooves during a very short time after the stopper is disengaged from one of the grooves whereby the auxiliary stopper means prevents the reverse movement of the rotary cylinder.

4,135,710

APPARATUS FOR ADJUSTING THE SLOPE OF SIDE FLAPS OF STACKED CARDBOARD BLANKS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Apr. 7, 1977, Ser. No. 785,581

Claims priority, application Italy, Apr. 12, 1976, 3397 A/76

Int. Cl.[2] B65H *1/06, 3/08*

U.S. Cl. 271—165 **2 Claims**

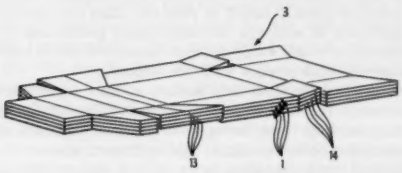
1. A device for adjusting the slope of side flaps of stacked blanks, in particular of stacks of cardboard blanks to be individually fed in quick sequence to a packeting machine for packeting cigarettes into hinged-lid packets, each of the stacks of blanks being contained in a vertical magazine unit from the bottom of which the individual blanks are rhythmically withdrawn by suction means, which device comprises

(a) at least one toothed bending roller facing a side surface of the stack of blanks in vertical alignment with the side flaps of the stack of blanks,

(b) a rocking lever carrying the toothed bending roller,

(c) a pin supporting the toothed bending roller,

(d) a free wheel device arranged between the pin and the roller, the device allowing the roller to rotate freely during an upwardly directed movement of the rocking lever carrying the roller and for locking the roller during a



downwardly directed movement of the rocking lever whereby the roller exerts a sliding friction on the outer side edges of the flaps only during the downwardly directed movement of the rocking lever to bend the flaps downwardly, and

(e) driving means for imparting to the toothed bending roller a cyclic, vertically directed reciprocating motion in contact relationship with the flaps, and in one direction corresponding to the descending direction of the blanks along the vertical magazine unit towards the suction means, whereby the sliding friction is exerted during at least the last part of the motion in the one direction and along at least a bottom portion of the side surface of the stack of blanks.

4,135,711

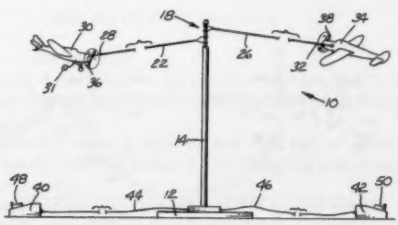
TETHERED AIRPLANE ASSEMBLY

Ralph J. Holt, 5069 LaSierra Blvd., Riverside, Calif. 92503

Filed Jul. 11, 1977, Ser. No. 814,181

Int. Cl.[2] A63H *27/04*

U.S. Cl. 272—31 A **2 Claims**



1. A tethered airplane assembly comprising:

a support base;

a central pylon mounted on said support base;

a first tether line connected to a first airplane;

a second tether line connected to a second airplane;

said first and second airplanes each having an electric motor driving the propeller;

said first and second tether lines each having a positive wire and a negative ground wire, and each tether line having one end thereof connected to the top portion of said central pylon;

a first remote control box electrically connected to said first airplane through said pylon and said first tether line;

a second remote control box electrically connected to said second airplane through said pylon and said second tether line;

means located at the top portion of said central pylon for electrically connecting said one end of said first and second tether lines in rotative contact with the pylon so as to allow said tether lines to swing around the pylon;

said means comprising a dielectric hollow tube mounted on the top portion of said pylon;

at least three conductive sleeves placed one above the other on said tube;

conductive metal eye members connected to said one end of each of said positive wires and said negative ground wires of said tether lines, each of said eye members having an aperture slightly larger in diameter than said sleeve, said apertures of said eye members being positioned on said sleeves to rotate freely around the sleeves while maintaining electrical contact with the sleeves;

said dielectric hollow tube having at least three apertures between the exterior of the tube and the interior of the tube, said apertures being positioned so that each of said sleeves is covering one of said apertures; and

electrical wires extending from each of said remote control boxes through said the interior of said pylon and said tube, each of said control box electrical wires having a separate positive wire and a ground wire, one end of said positive wire of one control box being inserted through one of said apertures in said tube and electrically connected to one of said sleeves, one end of said positive wire of the other of said control box wires being inserted through a second of said apertures in said tube and electrically connected to the second of said sleeves, said ground wires of each of said control boxes being inserted through the third of said apertures in said tube and each electrically connected to the third of said sleeves, said third sleeve being positioned between said first and second sleeves, and serving as a common ground for both of said airplanes.

4,135,712

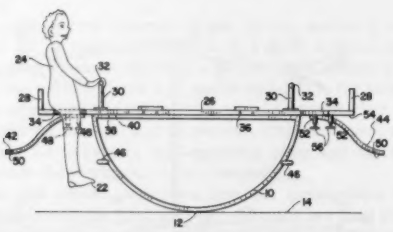
ROCKING TOY

Ron Fitzsimons, 5557 Fleming St., Vancouver, British Columbia, Canada

Continuation-in-part of Ser. No. 663,855, Mar. 4, 1976, abandoned. This application Jun. 22, 1977, Ser. No. 806,051

Int. Cl.[2] A63G *11/00*

U.S. Cl. 272—56 **5 Claims**



1. A combination seesaw and rocking device comprising a pair of coaxially aligned substantially hemi-circular shaped base support members adapted to move in tandem in cam fashion relative to a horizontal support surface, a pair of horizontally disposed flat support members transverse said base members and extending thereinbetween, a solid flat suspension member disposed across the midpoint of the open end of said base members and in contact therewith, a pair of first flat upright support members disposed at the distal ends of said suspension member, each of said pair of first flat upright supporting members having a flat lateral surface, said lateral surface extending normal to said suspension member, said lateral surface of each of said first upright support members in opposed relationship to each other and having a marginal edge thereof engaged with an upper surface of said suspension member, said pair of first support members adapted to function as a back support for a rider seated thereon, a pair of second flat upright members each having a horizontal gripping portion disposed forward of said first support members and adapted to serve as handle means for said rider, one of said pair of said second flat upright members being disposed fixedly secured to said suspension member, the other of said pair of second flat upright members being disposed selectively at at least two locations forward of one of said first support members, said suspension member defining a pair of opposed notched areas between each of said first and second upright members that is adapted to receive the thighs of said rider, said suspension member extending beyond the arc of said hemicircle, a pair of spring members, said pair of spring members being fabricated from a material having spring-like characteristics, one end of said pair of spring members being secured to said suspension member, the other end of said pair of spring members extending beyond said arc of said hemicircle, said other end of said spring members extending downwardly from said suspension member, means to adjustably secure said spring members to said suspension member such that said other ends of said spring members may be disposed at a variety of locations outwardly from said arc of said hemicircle.

4,135,713

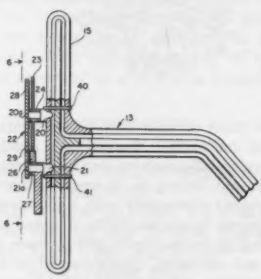
REVOLVING SKIPPING DEVICE AND COUNTER

Harold B. Martin, West Caldwell, N.J., assignor to Graber-Rogg, Inc., Cranford, N.J.

Continuation-in-part of Ser. No. 749,840, Dec. 13, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,802

Int. Cl.[2] A63B *5/20*; G06M *1/22*

U.S. Cl. 272—74 **5 Claims**



1. A revolving skipping device having a crank portion, and a counter connected to the crank portion, said counter including:

a pair of fixed posts connected to the crank and located in spaced parallel relationship,

a ratchet cooperatively associated with one post for revolving thereabout, said ratchet having numerals and gear teeth around the circumference thereof,

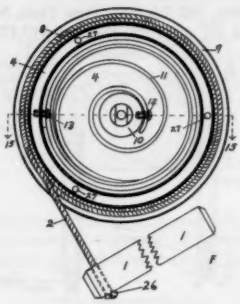
an indexing pawl cooperatively associated with the other post for revolving thereabout, one end of said indexing pawl capable of meshing with the gear teeth, and

an opposing weighted mass connected to the opposite end of said indexing pawl and generally hanging towards the direction of the ground, said weighted mass being offset from the common plane of the ratchet and pawl and capable of moving between said pair of fixed posts.

4,135,714
GOLF SWING MUSCLE DEVELOPER

Ralph L. Hughes, 6014 S. Croft Ave., Los Angeles, Calif. 90056

Filed Feb. 3, 1976, Ser. No. 654,762
Int. Cl.[2] A63B *21/04*
U.S. Cl. 272—136 5 Claims

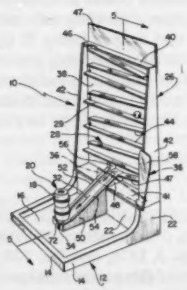


1. A golf swing muscle developer comprising a handle, a flexible cord, a pulley, a stationary axle, a mounting bracket and an elongated coiled spring means; said handle connected to one end of said flexible cord, the other end of said flexible cord wound around and attached to said pulley, said pulley mounted and rotatable upon said stationary axle, said stationary axle attached to said mounting bracket, means for attaching said mounting bracket to a supporting surface, means for anchoring one end of said coiled spring means to a stationary support, means for connecting the other end of said coiled spring means to said pulley whereby the pulling of said handle away from said pulley, by the operator in performing a simulated golf stroke downswing, causes said flexible cord to unwind on the groove of said pulley and to rotate said pulley on said stationary axle against the strong tension of said coiled spring means as said coiled spring means is stretched by this action; said spring means causing automatic rewinding of said flexible cord in groove of said pulley when the operator returns said handle toward said pulley when making a simulated golf stroke backswing.

4,135,715
TIMED STACKING GAME

Steven T. Soulos, 55 Alfred Drowne Rd., Barrington, R.I. 02806

Filed Jan. 27, 1977, Ser. No. 763,227
Int. Cl.[2] A63F *7/00*
U.S. Cl. 273—1 R 3 Claims

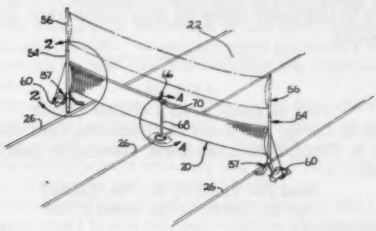


1. A game wherein construction pieces are assembled in a race against time to test the combined skill, dexterity and judgment of individual or group players, including a plurality of separate construction pieces capable of being assembled to form a readily collapsible composite structure, a base having a selected area thereof for supporting said structure, and a timing mechanism operatively associated with said base, said timing mechanism and said base cooperatively forming a path, and a movable game piece adapted to travel said path from a starting point thereof to a terminal portion thereof, said terminal portion of said path intersecting said construction support area so that said game piece may engage and impact said structure to cause same to collapse, said timing mechanism comprising an elevated path and said game piece adapted to descend along said path by means of gravity, said timing mechanism further including a housing supported by said base in a generally elevated position relative thereto, said housing comprising a vertically disposed, rearwardly inclined wall, a plurality of downwardly inclined track members secured to said wall and defining a zig zag path whereby said game piece is adapted to progressively move from said starting point along each of said track members to said terminal path portion, said terminal path portion comprising a ramp extending between said selected area and said zig zag path portion, said ramp including a first ramp segment forming a continuation of said zig zag path portion directed from said housing towards said base and a second ramp segment disposed on said base, the bottom of said second ramp segment having a platform defining said selected construction area, and stop means adapted for positioning generally between said ramp segments to stop the movement of said descending game piece from reaching said construction area.

4,135,716
PORTABLE MEANS FOR SUPPORTING A NET

Sam Ginsburg, 10709 Ashton Ave., Los Angeles, Calif. 90024

Filed Oct. 26, 1976, Ser. No. 735,623
Int. Cl.[2] A63B *69/00*
U.S. Cl. 273—29 BC 10 Claims

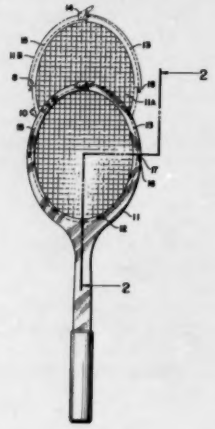


1. A portable net structure comprising:
a net;
a first pair of poles;
a second pair of poles, each hollow and adapted for insertably receiving at least a portion of one of said first pair of poles;
means for securing each of said first pair of poles in an inserted position within a corresponding pole of said second pair;
means for securing each of said first pair of poles in a partially extended position within a corresponding pole of said second pair of poles;
base means for supporting each of said second poles;
ballast weight; and
extended member coupled to said base means and extending outwardly away in general alignment with said net for receiving said ballast weight to secure said base means and poles against the tension exerted by said net;
each of said first and second pair of poles having net attachment means attached thereto;
whereby said net may be selectively affixed to either said first pair of poles in said extended position or to said second pair of poles, for vertical adjustment thereof.

4,135,717
TENNIS RACQUET WITH INSERT

Philip F. DiLeo, P.O. Box 388, Boulder, Colo. 80302

Continuation-in-part of Ser. No. 567,922, Apr. 14, 1975, abandoned. This application Oct. 28, 1975, Ser. No. 626,510
Int. Cl.[2] A63B *49/02*
U.S. Cl. 273—73 L 6 Claims

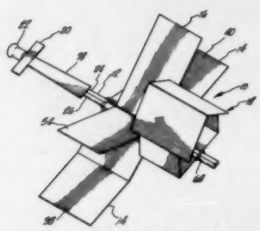


1. A racquet having a replaceable playing surface, said racquet including a one-piece solid frame member having a handle and a head portion, said head portion being provided with an arcuate opening with groove means for receiving an insert, and a racquet insert comprising a rim with suitable playing surface secured fixedly therein, pivotable spring lever means and wire means acting with locking means to provide locking and unlocking of said insert within the head of said frame portion of the racquet.

4,135,718
TOY GLIDER AND TARGET GAME

Thomas R. Loewy, 1746 Loma Dr., Camarillo, Calif. 93010, and Pat R. Tuttle, 6902 Laurelhurst, Huntington Beach, Calif. 92647

Filed Jul. 11, 1977, Ser. No. 814,461
Int. Cl.[2] G09B *67/00*; A63H *27/00*
U.S. Cl. 273—95 B 15 Claims

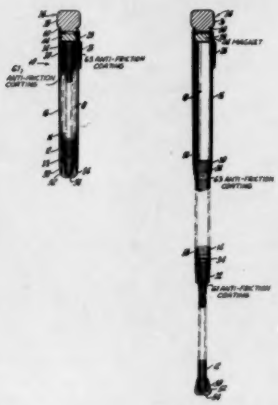


1. A toy glider comprising an elongated fuselage, a first wing member carried by said fuselage, a second wing member carried by said fuselage and disposed above said first wing member, an open ended tunnel member carried by said fuselage rearwardly of said first and second wing members for guiding said glider and maintaining a desired pitch while said glider is in flight, said first and second wing members and said tunnel members being slidably mounted on said fuselage for adjusting the position of said wing members and said tunnel members on said fuselage thereby varying the range of said glider, and a forward horizontal stabilizer mounted on said fuselage forward of said first and second wing members, said stabilizer defining a pair of horizontal portions extending outwardly from said fuselage.

4,135,719
SPRING WHIP

Harold N. Braunhut, 200 5th Ave., New York, N.Y. 10010

Filed Jul. 20, 1977, Ser. No. 817,173
Int. Cl.[2] F41B *15/00*
U.S. Cl. 273—84 R 7 Claims



7. A spring whip comprising a hollow housing serving as a hand grip and providing an internal storage compartment, plural lengths of helically wound springs, said springs being of selected diameter sizes ranging from a small diameter spring to a large diameter spring, said springs being operatively arranged relative to each other about a common axis so as to be movable between a telescoped storage position within said storage compartment and an extended whipping position extending from a first end of said hollow housing, said springs including engaging means for interconnection of telescoped ends of said springs in said extended whipping position, retaining means coupled to said hollow housing for normally retaining said springs in said telescoped storage position, said retaining means including a magnet positioned at an opposite second end of said hollow housing, said springs being fabricated from a magnetic attracting material, cap means for closing said second end of said hollow housing, said cap means including a head portion and a tubular body portion connected thereto, said magnet being retained within said tubular body portion, said tubular body portion extending into said second end of said hollow housing, said magnet being fit tightly within said tubular body portion, an air space being provided between said magnet and said head portion, and a radial air hole being provided in said tubular body portion and communicating with said air space to permit said magnet to be positioned into said tubular body portion.

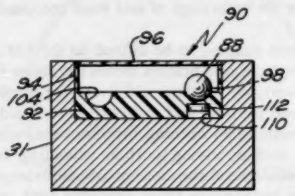
4,135,720
GOLF PUTTER PRACTICE DEVICE

William E. Lancellotti, 371 Broadway, Providence, R.I. 02903

Filed Sep. 3, 1976, Ser. No. 720,620
The portion of the term of this patent subsequent to Sep. 7, 1993, has been disclaimed.
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 A 14 Claims

1. A golf putter practice device comprising indication means including a first area for receiving a movable indicator, a plurality of separate indicator receiving areas, means operatively associating said indicating means with the top surface of the putter so as to be viewable by the golfer and wherein said

first area is disposed toward the rear edge of the putter and the separate areas are disposed toward the front or hitting edge of the putter, whereby momentum transmitted to said indicator during a putting stroke and upon impact with a ball serves to

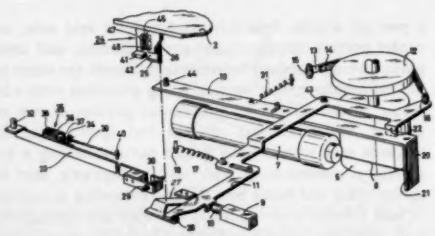


dislodge the indicator from said first area into one of said other areas depending upon the alignment of the putter face and the ball during impact, said indicator comprising a non-liquid, unitary solid ball.

4,135,721
VIDEO DISC PLAYER

Eduard Camerik, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,840
Claims priority, application Netherlands, Feb. 10, 1977, 7701383
Int. Cl.[2] G11B *1/00, 17/00*
U.S. Cl. 274—1 D **3 Claims**

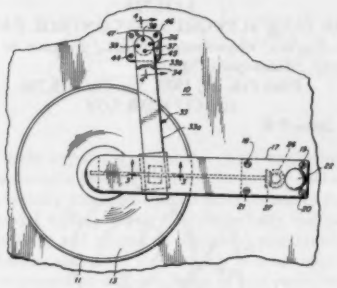


1. Apparatus for enclosing a rotating disc, comprising
a housing,
spindle means in said housing for supporting said disc,
spindle motor means in said housing for rotating said spindle,
a cover pivotally mounted on said housing and displaceable to a fully open position, a fully closed position and a safety position intermediate said fully opened and fully closed positions,
controllable voltage supply means for selectively providing electrical power to said spindle motor means,
cam operated switch means for causing the electrical power from said voltate supply means to energize said motor means in response to the movement of the cover to its fully closed position and for stopping the energizing of said motor means in response to the movement of the cover to its safety position and the fully closed position,
braking means for reducing the speed of the motor means in response to the movement of said cover to its safety position,
electromagnetic safety means actuable by electrical current therethrough for preventing the cover from being released from said safety position to said fully open position, and
safety circuit means for connecting said electromagnetic safety means to said motor means in response to the movement of said cover to its safety position,
said motor means further comprising means for inductively generating electrical current in response to rotation of said motor in the absence of electrical power from said voltage supply means, whereby said electromagnetic safety means is actuated to prevent the cover from being released from the safety position until the speed of the motor has decreased to a predetermined rotational speed.

4,135,722
RECORD-CUTTING SYSTEM

Rollie W. Paulson, 349 Cummings, NW., Grand Rapids, Mich. 49504, and Glenn B. Morse, Grand Rapids, Mich., assignors to Rollie W. Paulson, Grand Rapids, Mich.

Filed Aug. 26, 1977, Ser. No. 827,938
Int. Cl.[2] G11B *3/38*
U.S. Cl. 274—23 A **5 Claims**



1. A record-cutting machine including a base structure, a turntable rotatably mounted on said base structure, a radius arm pivotally mounted on said base structure, a transducer mounted on said radius arm and having a stylus providing oscillations in a characteristic direction, and cross-feed means establishing a controlled movement of said radius arm across and above said turntable for cutting a spiral groove in a record blank mounted on said turntable, wherein the improvement comprises:
a support frame mounted on said base structure and a feed screw rotatably mounted in said support frame on an axis extending across and above said turntable, and a nut in threaded engagement with said feed screw, together constituting a part of said cross-feed means;
a member slideably mounted on said radius arm and pivotally connected to said nut, said transducer being mounted on said radius arm in a clearance position with respect to said slideable member, and disposed so that said characteristic direction of the oscillations of said stylus is oriented at an angle of approximately twenty-five degrees to the longitudinal axis of said radius arm, said transducer being mounted on the underside of said radius arm, and said slide member embracing the top and opposite edges of said radius arm exclusively; and
drive means for said feed screw.

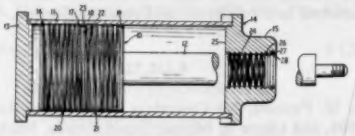
4,135,723
PISTON ROD SEAL

William J. Urquhart, Tumbi Umbi, Australia, assignor to F.B.J. Engineering Services Pty, Ltd., Granville, Australia

Division of Ser. No. 639,045, Dec. 9, 1975, Pat. No. 4,048,908.
This application Sep. 16, 1977, Ser. No. 833,746
Claims priority, application Australia, Dec. 9, 1974, 76169
Int. Cl.[2] F01B *31/10*; F16J *15/40*
U.S. Cl. 277—203 **1 Claim**

1. A piston rod seal for use in hydraulic rams and other fluid operated devices, said piston rod seal comprising a bore surrounding a piston rod, a circumferentially complete sealing device in said bore arranged to fit closely around and form a fluid tight seal with said piston rod, and left and right hand intersecting helical channels formed over a length of said bore

between that end of the seal subjected to a working fluid under pressure and the said sealing device, the said channels terminating at each end in a circumferential groove formed around said bore adapted to form a reservoir of working fluid.

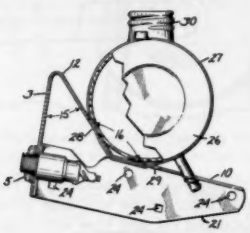


4,135,724

GAS TANK SUPPORT AND CONTROL PANEL

Glenn L. Larsen, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Feb. 17, 1978, Ser. No. 878,788
Int. Cl.[2] B23B *5/34*
U.S. Cl. 280—5 R **6 Claims**



1. A gas tank support and control panel mounting bracket for use on a snowthrower, power lawn mower, or like power equipment, comprising:

a flat elongated control mounting panel for mounting various engine controls;

an elongated gas tank supporting panel generally orthogonal to and spaced from said control mounting panel for mounting a gas tank;

an elongated spill diverting panel intermediate said control panel and gas tank supporting panel and positioned obliquely with respect thereto, one side of said spill diverting panel defining an acute dihedral angle with respect to said control mounting panel, the spill diverting panel also defining an obtuse dihedral angle with respect to said gas tank support panel, with said support panel and said spill diverting panel combining to provide a support structure for the gas tank;

connective means interconnecting said control mounting, gas tank supporting and spill diverting panels for maintaining their positional relationship with respect to one another; and

mounting means carried by said bracket for mounting said bracket to a unit of power equipment for use therewith..

4,135,725

REMOVABLE WHEEL AND HANDLE APPARATUS FOR TRASH RECEPTACLES

Sabeto DiRoma, 44 Fielding Ter., Uncasville, Conn. 06382

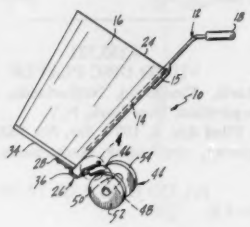
Filed Aug. 17, 1977, Ser. No. 825,231
Int. Cl.[2] B62B *1/20*
U.S. Cl. 280—47.26 **4 Claims**

1. A removable wheel and handle apparatus for use with trash receptacles, such as garbage cans, or the like comprising, in combination:

handle means including an elongated central portion having a gripping means disposed on one end thereof and a pair of outwardly extending members affixed to said central portion a distance from said gripping means, said outwardly extending members being in one plane displaced from said central portion in a V-shaped configuration providing an opening between said central portion and said outwardly extending V-shaped members, said opening being adapted to receive the open edge of said trash receptacle therebetween;

bracket means adapted to be affixed to the bottom of said trash receptacle, said bracket means having an end portion and an overlying portion, said overlying portion overlying said end portion, said end portion and said overlying portion forming an opening therebetween, said end portion and said overlying portion extending beyond the outer perimeter of the bottom of said receptacle, said extending end portion being provided with an aperture, and

wheel assembly means having a tubular center portion, an axle, said axle secured to said tubular portion and having



a pair of wheels rotatably mounted on said axle, said center portion having a passageway therein, said center portion being disposed between said wheels, the other end of said tubular center portion being provided with a leaf spring means affixed to said center portion at one end thereof, the other end of said leaf spring extending towards said wheels, said center portion having a hole therein communicating with said passageway, said leaf spring other end being bent 90° and extending in said hole of said tubular center portion and into said passageway, said other end of said leaf spring being disposed removably engaging said aperture in said end portion when said end portion of said bracket means is inserted in said passageway and said aperture is aligned with said hole, whereby said bracket means is removably secured to said wheel assembly means upon the displacement of said other end of said leaf spring into and out of engagement with said aperture in said end portion of said bracket means.

4,135,726

SKATEBOARD

Bryan Beaver, 317 Lorenzi St., Las Vegas, Nev. 89107

Filed Aug. 29, 1977, Ser. No. 828,909
Int. Cl.[2] B60D *3/00*
U.S. Cl. 280—87.04 A **12 Claims**

1. A skateboard comprising an elongated platform for supporting a person thereon in a standing position,

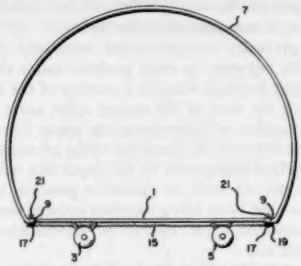
a pair of skate wheels secured to the underside of said platform adjacent each end thereof,

a hand rail extending substantially between the ends of the skateboard and overlying the platform,

means for removably securing the ends of the hand rail to the respective ends of the platform,

said means for removably securing comprising a socket portion at each end of said hand rail for removably receiving the respective end of said platform and said socket

portions being removably mounted on the end of the skateboard, and including means extending between the



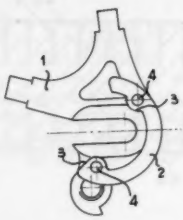
socket portions for biasing them against the ends of the platform.

4,135,727

MOUNTING OF THE TRANSMISSION CHAIN OF BICYCLES

Tullio Campagnolo, Corso Padova 168, 36100 Vicenza, Italy

Filed Nov. 5, 1976, Ser. No. 739,143
Claims priority, application Italy, Jul. 6, 1976, 25049 A/76
Int. Cl.[2] B62M *9/12*
U.S. Cl. 280—236 **2 Claims**



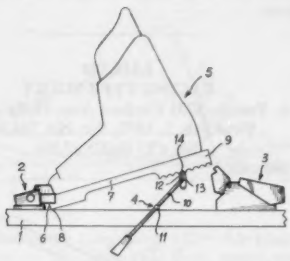
1. In a bicycle having a frame having a rear fork on which is mounted the rear wheel of the bicycle, a plurality of speed change sprockets of different size concentric with the rear wheel, transmission chain that extends over said sprockets for driving the rear wheel of the bicycle, and speed change means for selectively moving said transmission chain from sprocket to sprocket thereby to alter the gear ratio of the bicycle; the improvement comprising a fixed arcuate support on the inner side of the end of the rear fork of the bicycle, substantially concentric with the axis of the rear wheel of the bicycle, and means for selectively moving the transmission chain from the sprocket adjacent said support onto said support in a position in which said chain extends about and rests on the arcuate outer surface of said support thereby to support said chain in a stretched position and to enable removal of the rear wheel and sprockets of the bicycle with the chain remaining in said supported position, said speed change means comprising a control lever mounted on the frame and rotatable among a plurality of positions to move said chain from sprocket to sprocket, said lever being movable into a further position beyond said plurality of positions to move said chain from said adjacent sprocket onto said support, a pawl mounted for oscillation on said lever, two ratchet gear teeth mounted on said frame, a spring urging said pawl into engagement with said teeth, one of said two teeth fixing the position of said lever in which said speed change means moves said chain only from sprocket to sprocket among said sprockets of different size, the other of said two teeth fixing a position of said lever in which said speed change means moves said chain between said adjacent sprocket and said support.

4,135,728

DEVICES MOUNTED ON A SKI

Georges P. J. Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Filed Sep. 1, 1976, Ser. No. 719,449
Claims priority, application France, Sep. 3, 1975, 75 26964
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **6 Claims**



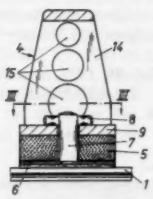
1. A ski brake apparatus mounted on a ski employing a lever assembly actuatable by a ski boot and having a pedal at its end which is pivotally mounted on said lever assembly through a pin, said pedal having a pair of substantially flat elongated opposite surfaces and having an elongated non-circular cross-section whereby said pedal forms a pair of lever arms, each of which is fulcrumed on said pin, lither of said pedal lever arms being actuatable in response to contact with said ski boot to urge said pedal into a position substantially parallel to a lower surface of said ski boot to enable a sole of said boot to slide along a flat upper surface of said pedal during pivotal movement of said pedal without interference by projections on said sole of said boot.

4,135,729

SKI SAFETY DEVICE

Egidius Brangenberg, Riffelstrasse 46, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Apr. 7, 1976, Ser. No. 674,740
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1975, 2516194
Int. Cl.[2] A63C *11/00*
U.S. Cl. 280—11.37 E **14 Claims**



1. A device for preventing unintentional cross of skis during skiing, comprising a support mountable on an upper surface of a ski; a frame above said support and provided with a bottom wall having a lower side facing said support and with an upper side; a member of elastically compressible material having an upper and a lower surface and being interposed between said support and said lower side of said bottom wall, one of the and lower surfaces of said member being fixedly attached to one of said lower side of said bottom wall and said support; means for detachably connecting said frame with said support, comprising an elongated opening in said bottom wall and a pair of pockets in said upper side each extending outwardly from a different longitudinal side of said opening, and a rigid non-turnable projection extending upwardly from said support and

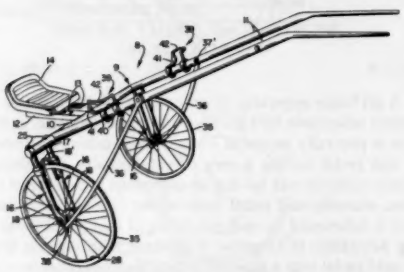
having a terminal section extending through said opening and provided with two portions which project from said terminal section opposite one another and substantially parallel to said support and which are each receivable in one of said pockets in response to turning of said frame relative to said support about an axis coinciding with the elongation of said projection; and means carried by the other of said upper and lower surfaces of said member for facilitating turning of said frame relative to said support.

4,135,730

RACING TYPE SULKY

Smokey A. Yunick, 1731 Cordova Ave., Holly Hill, Fla. 32017

Filed Feb. 2, 1977, Ser. No. 764,872
Int. Cl.[2] B62D *27/04*
U.S. Cl. 280—65 **4 Claims**



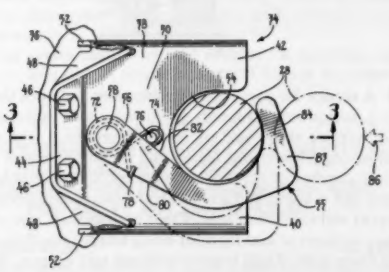
1. A racing type sulky comprising a rigid tubular frame including a rear cross member and a pair of transversely spaced thills fixed to and extending forwardly from the cross member, a seat, means fixed to and extending from the cross member on which the seat is supported, fork members connected to and extending downwardly from each end of said cross member, a ground engaging wheel disposed beneath each end of the cross member and rotatively connected to and disposed between a pair of said fork members, and spring suspension means contained within each fork member for yieldably supporting the frame on the wheels.

4,135,731

UPPER LINK STORAGE CLIP

Leo J. Lorenz, Farmington, and Auguste Asztalos, Plymouth, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 18, 1977, Ser. No. 816,833
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—461 A **4 Claims**



1. An upper link storage clip in combination with a tractor having a pair of rearwardly extending lower draft links and an upper link the forward end of which is secured to a rear portion of the tractor for movement relative thereto between operative and storage positions, characterized in that the upper link storage clip includes:

structure including a pair of rearwardly extending spaced apart arms, a forward portion of the structure being secured to a rear portion of the tractor;

a hook pivotally interconnected with said structure and movable between an open position and a closed normal operating position wherein a portion of the hook extends between the ends of the spaced apart arms, said portion being capable of maintaining the upper link in a storage position between the arms and being provided with a rear cam surface engageable by the upper link when the upper link is moved from its operative position to its storage position, the hook being cammed open against spring bias to permit the upper link to be moved into the storage position; and

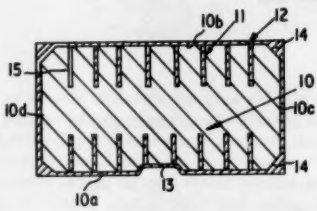
a spring operable to bias the hook to its closed normal operating position.

4,135,732

SKIS

Hans P. Magnus, Hop, Norway, assignor to Magnus & Co. A/S, Nesttun, Norway

Filed Feb. 25, 1977, Ser. No. 772,045
Claims priority, application Norway, Mar. 11, 1976, 760845
Int. Cl.[2] A63C *5/12*
U.S. Cl. 280—610 **7 Claims**



1. Ski comprising a core of light-weight material and an outer sheathing composed of a reinforced synthetic plastics material, said core having an internal reinforcement of relatively narrow ribs extending substantially at right angles to at least one of its upper side and its under side, and directly unified with said plastics material of said sheathing, wherein said ribs consist of unreinforced synthetic plastics material being filled in narrow grooves formed in said core and said ribs having a wall thickness less than 1.5 mm and preferably about 0.5 mm, and wherein corner edges of the core over substantially the whole length of the ski are chamfered enabling said edges to be strengthened with a thickness of about 2 - 3 mm of said reinforced synthetic plastics material of said sheathing, said core at the ends of said ski being narrower than at the middle of the ski to permit said reinforced synthetic plastics material of said sheathing to form a substitute protective layer for edges of said ski at said ends.

4,135,733

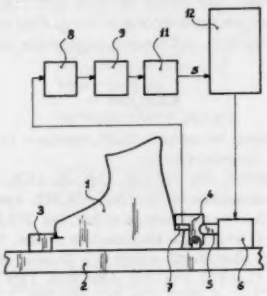
SAFETY BINDINGS FOR SKIS

Georges P. J. Salomon, Annecy, France, assignor to S.A. Salomon Etablissements Francois Salomon & Fils., Annecy, France

Filed Jun. 6, 1977, Ser. No. 804,148
Claims priority, application France, Jun. 18, 1976, 76 18513
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—612 **8 Claims**

1. A safety binding for a ski comprising a device for holding a ski boot on a ski, means for locking the holding device in position, means for releasing the locking means to free the holding device, and an electrical control circuit for actuating the releasing means and comprising means for detecting a force

exerted on the leg of a skier and for producing a signal as a function of said force, and means for treating the signal to control operation of the releasing means dependent upon the intensity and duration of the force, said signal treating means including means for comparing the signal with successively



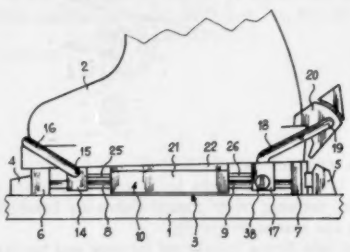
different threshold values corresponding to different durations of application of force and means for effecting operation of the releasing means if the signal exceeds, in a time interval corresponding with a predetermined threshold level, the magnitude of the latter threshold level.

4,135,734

SKI BINDING

Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon & Fils, Annecy, France

Filed Mar. 11, 1977, Ser. No. 776,752
Claims priority, application France, Mar. 18, 1976, 76 07868
Int. Cl.[2] A63C 9/00
U.S. Cl. 280—618 **14 Claims**



1. A device for adjusting the distance between front and rear retaining elements cooperating with the toe and heel of ski boot, said retaining elements being movably mounted in a structure fixed at least temporarily to a ski and being connected to one another by a drive mechanism for moving said retaining elements in opposite directions along the longitudinal axis of said ski, comprising

(a) a single control means for actuating said drive mechanism;

(b) said drive mechanism comprising at least two systems for transmitting movement;

(c) a member mounted for rotation about a fixed axis secured to said structure and at right angles to the plane of said ski;

(d) hinge means on said rotatable member respectively located on opposite sides of said fixed axis;

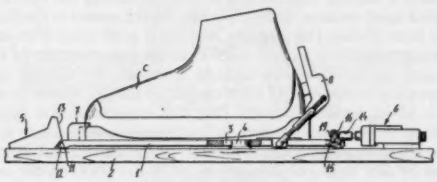
(e) said two transmission systems being articulated to one of said retaining elements and to said rotatable member, respectively.

4,135,735

SAFETY SKI BINDING WITH BOOT-CLAMPING MOVABLE PLATE

Jean J. A. Beyl, 10, Blvd. Victor Hugo, Nevers, Nievre, France

Filed Feb. 4, 1977, Ser. No. 765,819
Claims priority, application France, Feb. 18, 1976, 76 04385
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—618 **8 Claims**



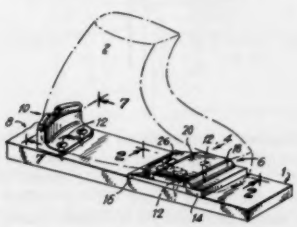
1. A safety ski binding comprising a movable plate adapted to be clamped to an appropriate ski boot, means detachably securing the respective ends of said plate to a ski, said means comprising means on one end of said plate forming a longitudinally recessed downwardly extending ramp extending away from said plate end, and means for securing the recessed end of said plate to said ski comprising a bolt engageable with said recess, means supporting said bolt for both longitudinal and pivotal movement with respect to said ski, means mounting said bolt supporting means on the ski and means on said supporting means and said mounting means for urging said bolt into said recess and simultaneously resisting pivotal movement of said supporting means, said last means including a slidable piston mounted on one of said bolt supporting means and said mounting means, means on the other of said bolt supporting means and said mounting means engageable by said piston and forming a camming surface on either side thereof having inwardly directed, vertically extending walls, and a single spring simultaneously urging said bolt into said recess against said ramp, whereby lifting of the recessed end of said plate from said ski causes said ramp to press said bolt against the resistance of said spring, the contour of said ramp thus determing the resilient resistance counteracting the lifting movement of the one end of said plate, and also urging said pistion against the inwardly directed walls of said camming surface, whereby the contour of the latter determines the value of the resilient resistance countering the pivotal movement of said bolt supporting means.

4,135,736

ADJUSTABLE BOOT-SKI INTERFACE MECHANISMS

Barry L. Druss, Holliswood, N.Y., assignor to Chimera Research & Development Inc., Holliswood, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,698
Int. Cl.[2] A63C 9/00
U.S. Cl. 280—636 **2 Claims**



1. An improved adjustable boot - ski interface mechanism for elevationally adjusting interface conditions between a skier's boot (2) and a ski (1) for front and rear pivot conditions, a

couple being formed between the interface mechanism and a releasable binding (82) that is fixed to the ski; the interface mechanism comprising at least one front rest mechanism (4) fixed to the ski for cooperation with at least one of front (6) and rear interface portions (10) of the boot; the binding serving to exert a predetermined retaining force before releasing the boot from the ski, upon occurrence of an external separating force, when the skier encounters an obstacle which results in the latter force; said interface mechanism comprising means in the form of a bearing member (18, 19) for supporting the boot in a spaced-apart relation with respect to the ski; means in the form of a base portion (14, 28) that is slidable with respect to said bearing member in a plane parallel to the upper surface of the ski and can be selectively secured to the ski, for holding said supporting means spaced with respect to the ski; means in the form of an inclined portion (16) that constitutes the upper surface of said base portion, at least partly intermediate said supporting and said holding means, for the elevational adjustment of said supporting means between the boot, on the one hand, and the ski as well as the binding thereon, on the other; and means in the form of at least one immobilizing screw element (12) for securing said base portion in a fixed position to the ski said bearing member having an aperture for receiving said screw, said screw passing through said aperture into the ski and preventing longitudinal movement of said bearing member, said base member having at least one longitudinal slot, said screw also passing through said slot and allowing selective longitudinal movement of said base member relative to said bearing member.

4,135,737

ADJUSTABLE UPPER DEFLECTION FITTING FOR A SHOULDER BELT

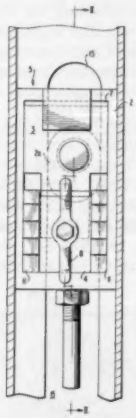
Hansjüergen Scholz, Echterdingen; Walter Jahn, Sindelfingen, and Jüergen Gimbel, Gechingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 1, 1977, Ser. No. 856,587

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655015

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—747 **7 Claims**



1. A mechanism accommodated in a hollow bearer for adjusting the height of an upper deflection fitting for the shoulder belt of a belt system, comprising slide means steplessly displaceable in guide means of the vehicle hollow bearer, first engageable means provided on a hollow bearer wall of the vehicle hollow bearer, detent means operatively connected with the deflection fitting and guided in a recess means of the slide means, said detent means being provided with second engageable means operable to engage in said first engageable means against the action of a spring force retaining the detent means in its normal position during those occurring tensional belt forces which exceed the tensional forces acting on the belt by the belt user during normal driving operation, characterized in that a gliding member cooperating with the detent means is arranged displaceable in height in the slide means, said gliding member displacing the detent means during correspondingly occurring tensional belt forces at least approximately transversely to the movement direction of the gliding member up to engagement of the first and second engageable means.

4,135,738

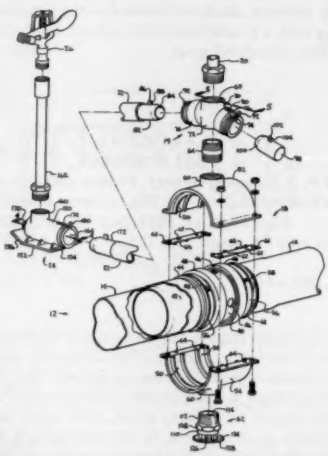
TRAIL LINE MOVES

Lloyd W. Clements, Woodland, Calif., assignor to IRECO Industries, Inc., Eugene, Oreg.

Continuation of Ser. No. 733,327, Oct. 18, 1976, abandoned, which is a continuation of Ser. No. 674,682, Apr. 7, 1976, abandoned, which is a continuation of Ser. No. 571,083, Apr. 24, 1975, abandoned, which is a continuation of Ser. No. 415,825, Nov. 14, 1973, abandoned, which is a division of Ser. No. 252,587, May 12, 1972, Pat. No. 3,807,638. This application Aug. 3, 1977, Ser. No. 821,525

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—5 **5 Claims**



1. In an irrigation swivel coupler,

a pipe having lateral ports and a pair of exterior annular collars defining outer thrust abutments bracketing the ports and spaced therefrom,

a swivel tube fitting loosely on the pipe and having in the end portions thereof a pair of interior annular collars defining inner thrust abutments and positioned between and spaced from the outer thrust abutments,

a pair of bearing rings positioned between the tube and the pipe and between the inner and outer thrust abutments,

the interior annular collars being spaced inwardly from the ends of the swivel tubes to define sockets receiving the rings,

and a pair of seals positioned between the inner thrust abutments and bracketing the ports.

4,135,739

OFF-SET WELDING RING

Kenneth J. Mackenzie, Paris, Tex., assignor to The Babcock & Wilcox Company, New York, N.Y.

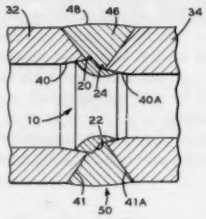
Filed Feb. 27, 1978, Ser. No. 881,975

Int. Cl.[2] F16L *13/02*

U.S. Cl. 285—22 **4 Claims**

1. In combination with tubes of unequal inside diameter to be

weld-united end to end, an asymmetrical welding ring disposed therebetween comprising an arcuate inner periphery and an irregular outer periphery, the outer periphery formed of first, second and third frusto-conical surfaces, each surface intersecting the next successive surface and the first and third surfaces intersecting the inner periphery, the first and third surfaces forming angles with respect to the axis of symmetry of the ring from about five degrees to about fifteen degrees, the second surface forming an angle with respect to the axis of symmetry from about 45° to about 65°, the first and second surfaces intersecting at the maximum diameter of the ring, and the first and third surfaces being at least partially contiguous with the inner periphery of the tube ends.



4,135,740

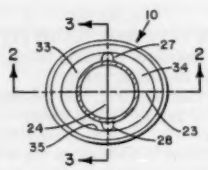
OVAL BELL CONCEPT

James J. Watson, Jr., McMinnville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 726,862, Sep. 27, 1976, Pat. No. 4,077,559. This application Dec. 7, 1977, Ser. No. 858,304

Int. Cl.² F16L *13/08*

U.S. Cl. 285—22 **5 Claims**



1. A tube joint of the type wherein a male member having a cylindrical outer surface is telescoped within a female member including

a pair of diametrically opposed nibs formed on the end of the male member projecting outwardly from the cylindrical surface thereof; and

an oval bell formed within the end of the female member having a major inside diameter which is substantially greater than the outside diameter of the male member and substantially greater that the diametral distance across the nibs and a minor inside diameter slightly less than the diametral distance across the nibs whereby the nibs are capable of being frictionally retained within the oval bell when the nibs are inserted along the axis of the minor inside diameter and solder can freely pass into the joint region between the male and female members along the major axis of the bell.

4,135,741

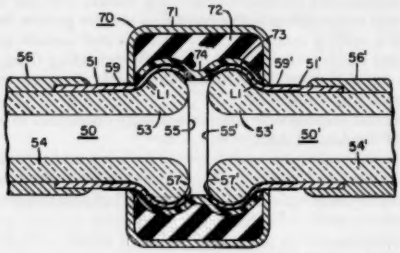
ARMORED PIPING SYSTEM

Peter S. Albertsen, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,572

Int. Cl.² F16L *9/14*

U.S. Cl. 285—55 **10 Claims**



1. In an armored piping system armored pipes are adapted to be mated with a coaxial conforming coupler for joining lengths thereof, said armored pipes comprising: an inner pipe member having a beaded end portion adapted to mate with said coupler, an outer pipe armor, extending from near a forward end of the bead and conforming in intimate contact with the outer contour of said inner pipe along a selected length thereof, a protective boot of corrosive resistant material overlapped with and sleeved between the inner pipe and a portion of the outer pipe armor in intimate contact from a point at least rearwardly of the bead to a forward end of the bead and continuously back over the exterior of the outer pipe armor from the forward end of the bead to a point at least rearwardly of the bead overlapping the forward end of the outer pipe armor, said boot providing both a shield for the forward end of the outer armor and a circumferential seal with the coupler and outer wall of the inner pipe when mated with the beaded end of the pipe, said outer pipe armor and protective boot being of sufficient rigidity to at least temporarily maintain the piping system and coupler intact should the inner pipe fail.

4,135,742

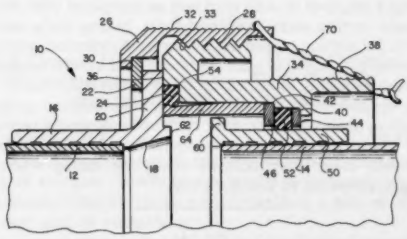
ADJUSTABLE TUBE COUPLING

Gordon H. Anderson, Harbor City, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 10, 1977, Ser. No. 767,406

Int. Cl.² F16L *21/00*

U.S. Cl. 285—87 **6 Claims**



1. An adjustable fluid type coupling adapted for connecting two ducts in a manner accommodating limited axial, angular, and longitudinal misalignment of the ducts comprising:

a first annular tube adaptor sealingly connected to an end of one duct, said first tube adaptor having an outwardly extending flange;

a retaining collar, one end of said retaining collar being internally threaded, the other end of said retaining collar

having an inwardly extending flange and an internal recessed annular surface;

a retaining means interposed between said outwardly extending flange and said inwardly extending flange, said outwardly extending flange adapted to abuttingly engage said recessed annular surface with freedom for radial movement relative thereto;

an annular compression sleeve having one end abutting against said outwardly extending flange, said one end of said compression sleeve having an annular groove therein;

a first sealing means positioned within said annular groove and bearing against said outwardly extending flange;

an annular coupling housing threadably secured to said retaining collar;

a second annular tube adaptor sealingly connected to an end of the second duct;

a second sealing means interposed between said second tube adaptor and said coupling housing, said second sealing means abutting against the other end of said compression sleeve; and

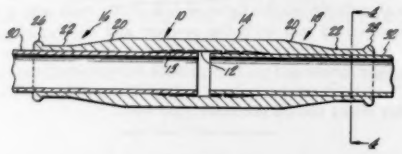
a retaining means on said second tube adaptor for limiting axial movement of said second tube adaptor relative to said first tube adaptor, said second tube adaptor being tiltable about said second sealing means, said retaining means on said second tube adaptor adapted to abuttingly contact said compression sleeve with freedom for angular movement relative thereto.

4,135,743

HEAT RECOVERABLE COUPLING FOR TUBING

John R. Hughes, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 6, 1977, Ser. No. 830,404
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—115 **11 Claims**



1. A coupling for tubing comprising a hollow member fabricated from a heat recoverable metallic material sized to recover upon heating to grip such tubing, said hollow member comprising a main, hollow body section having at least one opening for receiving tubing, a hollow stress distribution section extending from each such opening of said main hollow body section, each said hollow stress distribution section including a decrease in wall thickness as compared with that of the main section away from said main, hollow body section such that a portion of said hollow stress distribution section is structurally no stronger than the tubing, and a collar located at the outer extremity of each such stress distribution section and being the outermost portion of said hollow member gripping the tubing upon recovery, each such collar having a recovery hoop strength sufficient to substantially prevent motion of each such collar longitudinally along the tubing when the tubing is subjected to flexural stress.

4,135,744

TERMINAL FITTING FOR A TUBULAR CONDUIT

Robert E. Fouts, 2152 Van Karajan, San Pedro, Calif., assignor to Robert E. Fouts, Lawndale, Calif. 90732

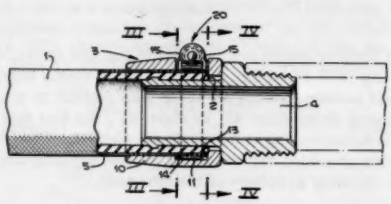
Filed May 13, 1976, Ser. No. 685,742
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—253 **1 Claim**

1. A protective device for a terminal portion of a tubular conduit having marginal end portions susceptible to fraying in use when attached to a separate tubular nipple for communicating pressurized fluid therebetween, said protective device comprising:

a substantially non-compressible housing having a central longitudinal bore therethrough defined by interior wall portions thereof for receiving said terminal portion of said conduit;

abutment means integral of said housing and extending radially inwardly relative to said central bore from said interior wall portions of said housing which define said central bore for restricting axial movement of said conduit through said central bore, said housing providing an encompasing supportive contact with end marginal areas of said conduit by said interior wall portions adjacent said abutment means;

non-compressible clamping means generally internal of said central bore and having adjusting means therefor extending external of said housing through an aperture in a wall portion thereof for securing said housing to said conduit and for securing said conduit with respect to said attachment nipple; and



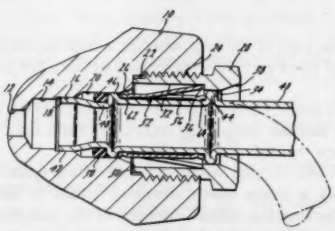
annular recess means integral of said housing and located in said interior wall portions adjacent said abutment means for receiving said clamping means positioned about said conduit end marginal areas within said housing whereby, as said clamping means is disengaged and withdrawn into said annular recess means, clearance is provided between said clamping means and said tubular conduit to allow unimpeded attachment and removal of said terminal fitting with respect to said conduit and when said clamping means engages said conduit to hold said conduit to said nipple, said housing protects said conduit end marginal areas against fraying.

4,135,745

QUICK CONNECT FLUID FITTING

David C. Dehar, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

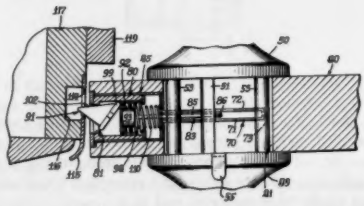
Filed Dec. 23, 1977, Ser. No. 864,077
Int. Cl.[2] F16L *21/00*
U.S. Cl. 285—319 **4 Claims**



1. A quick connect fitting for a hydraulic tube comprising a nut adapted to be threaded in a threaded opening in a housing, said housing having formed therein a fluid passage communicating with said opening, a central opening formed in said nut, an annular shoulder formed in said central opening, a tube adapted to be inserted within said nut and having formed

thereon spaced shoulders, a clip assembled on said tube intermediate said shoulders and having retainer fingers extending radially therefrom, a seal groove formed on one side of one of said shoulders at the innermost end of said tube, a seal in said groove said seal being adapted to sealingly engage the internal surface of said passage in said housing, one of said shoulders on said tube engaging the wall of said passage opening at an inner location and the other engaging the interior of the central opening in said nut thereby stabilizing said tube following assembly.

4,135,746
LATCH BOLT ASSEMBLY
John G. Sterling, 888 Country Club Rd., Crystal Lake, Ill. 60014
Filed Feb. 17, 1977, Ser. No. 769,586
Int. Cl.[2] E05C *5/00, 15/02*
U.S. Cl. 292—92 **12 Claims**



1. In a privacy lock or latch set for installation on interior doors of the class having an operator mechanism mounted through the door and provided with manually engageable knob means on opposite sides of the door for actuating a reciprocating latch bolt carried in a housing mounted so that actuation of the operator mechanism retracts the latch bolt inwardly of a vertical door edge to withdraw the same from door latching engagement with a jamb mounted strike plate, the operator mechanism having selectively operable locking means to prevent retraction of the latch bolt whereby to lock the door in a latched position; an improved latch bolt assembly normally responsive to actuation of the operator mechanism, but capable of strike disengaging activity to unlatch the door when the operator mechanism is locked, comprising: a plunger member mounted to reciprocate within said housing, link means positively interconnecting said plunger member with the operator mechanism for actuation thereby, a latching element mounted to reciprocate with said plunger member and having a nose portion normally projecting beyond the outer end of said member and door edge for latching engagement with the strike plate, and means carried by said plunger member for uniformly supporting and controlling said element for limited pivotal movement such that the application of predetermined opening force on the locked door pivotally actuates said element to retract said nose portion from said strike plate and release the locked door.

4,135,747
FENCE GATE LATCH
Gennarino Melilli, 17204 Marigold, Fontana, Calif. 92335
Filed Jun. 28, 1977, Ser. No. 810,870
Int. Cl.[2] E05C *1/04*
U.S. Cl. 292—175 **3 Claims**

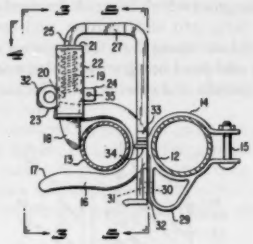
1. A latch for a fence gate of the type having a tubular frame which comprises:

(a) a "U" shaped yoke for receiving a tubular gate stile;

(b) means for attaching said yoke to a fence post whereby the plane of said "U" is substantially horizontal;

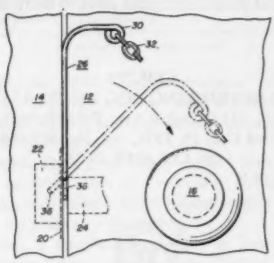
(c) a latch bolt slideable to at least partially close the opening of said yoke, said latch bolt having a beveled portion directed outward of said yoke whereby said gate stile can displace said latch bolt and enter said yoke;

(d) a coil spring urging said latch bolt to its closed position; and



(e) a stem attached to the rear of said latch bolt and extending through said spring, the portion of said stem remote from said latch bolt being graspable to retract said latch bolt.

4,135,748
PORTABLE DOOR LOCK
Charles K. Roberts, 517 S. Ridgewood Ave., Daytona Beach, Fla. 32014
Filed Jun. 21, 1977, Ser. No. 808,706
Int. Cl.[2] E05C *17/54*
U.S. Cl. 292—298 **6 Claims**



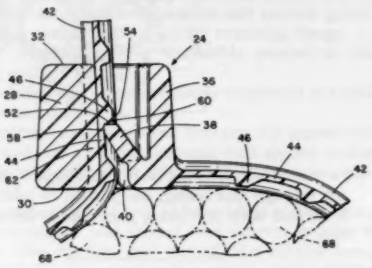
1. A method for latching a closed door having an inside knob on said closed door and a keeper recess in the jamb, comprising, inserting a connecting unit in said keeper recess in said jamb while the door is closed, and attaching said connecting unit to said inside knob of said closed door.

4,135,749
CABLE TIE
Jack E. Caveney, Hinsdale, and Roy A. Moody, Flossmoor, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.
Filed Jan. 19, 1977, Ser. No. 760,598
Int. Cl.[2] B65D *33/34*
U.S. Cl. 292—317 **19 Claims**

1. A one-piece molded thermoplastic tie for forming a plurality of elongate objects into a bundle of generally circular cross-section and for compressively holding a pair of objects together, said tie comprising:

an elongate strap including a pair of longitudinal spaced side rails joined by a web thinner than said rails, said rails and said web being substantially symmetrical about a first plane intersecting said rails and said web and also being substantially symmetrical about a second plane normal to said first plane and intersecting said web, said strap further comprising a plurality of spaced transverse teeth on only one surface of said web and said web having a second surface which is generally flat and substantially parallel to a plane including the crests of said teeth; and

a locking head joined to one end of said strap comprising an abutment wall, a strap entry face, a strap exit face, a strap receiving aperture extending between said faces, and a locking pawl which as molded extends from adjacent said entry face, into said aperture, and toward said exit face and said abutment wall for engaging at least one of said teeth, said pawl being movable between a threading position wherein said pawl is out of locking engagement with



said strap and a locking position wherein said pawl is disposed adjacent said entry face and is in locking engagement with said strap, said second web surface engaging said abutment wall and said strap being held between said wall and said pawl when said pawl is in its locking position whereby after said strap is disposed about said objects and threaded through said head, attempted retrograde movement of said strap causes said pawl to more firmly engage said strap.

4,135,750

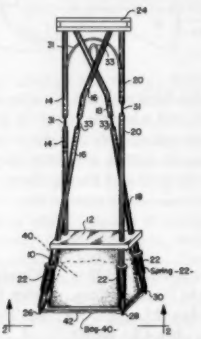
DEVICE FOR RETRIEVING DOG FECES, AND THE LIKE

Stanley A. Rosin, 115 S. Indian Ave., Palm Springs, Calif. 92262

Filed Dec. 19, 1977, Ser. No. 861,668

Int. Cl.[2] A01K *29/00*

U.S. Cl. 294—19 R **6 Claims**



1. A device for retrieving dog feces, and the like, comprising: a receptacle having an open bottom for receiving a disposable bag, said bag having a rubber band encircling the mouth thereof; a plurality of releasable support means mounted at predetermined positions around the periphery of the receptacle for engaging the rubber band and for supporting the disposable bag within the receptacle; a first release means connected to a first group of said support means and actuable to cause said first group of support means to release the rubber band and enable the rubber band to close the mouth of the disposable bag; and second release means connected to a second group of said support means and actuable to cause said second group of support means to release the rubber band and cause the disposable bag to fall out through the open bottom of the receptacle.

4,135,751

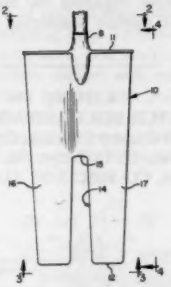
RAZOR CLAM SHOVEL

Wayne L. Gederos, P.O. Box 611, Coos Bay, Oreg. 97420

Continuation-in-part of Ser. No. 725,890, Sep. 23, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,139

Int. Cl.[2] A01B *1/02;* **A01D** *11/00*

U.S. Cl. 294—49 **2 Claims**



1. A clam shovel for digging clams in the surf comprising:
a shovel blade having front and rear faces, a rear edge joined to a shovel shaft and an opposite free cutting edge;
a single tapered slot extending inwardly longitudinally of said blade from an open end at a central portion of said cutting edge to a closed end terminating at a midportion of said blade;
said slot being wider at said open end than at said closed end;
said blade being laterally and longitudinally dished to provide a depression in said front face, with the maximum depth of said depression being in the vicinity of the closed end of said slot, and with said depression including both slotted and unslotted blade portions radiating from said vicinity;
said unslotted blade portion rearwardly of the closed end of said slot having a length dimension at least substantially as great as the length dimension of the slotted portion of said blade and having a maximum width dimension exceeding the maximum width dimension of the slotted portion of said blade;
the maximum width of said slot at said closed end selected so as to retain a legal sized clam in said blade depression in a portion overlying said closed end portion of said slot,
whereby in digging a razor clam in the surf a legal sized razor clam can be lifted from the sand through the surf on said depression by the pressure of water and fluidized sand flowing against and around the clam and out through said slot as the blade is lifted upwardly through the surf in a generally horizontal attitude.

4,135,752

GROUND PLUGGING DEVICE

William J. Long, 401 Sterling, Duenweg, Mo. 64841

Filed Dec. 15, 1977, Ser. No. 860,755

Int. Cl.[2] A01B *1/16*

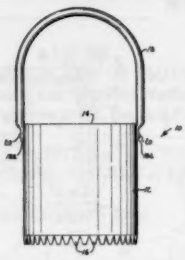
U.S. Cl. 294—50.7 **1 Claim**

1. A portable, hand carried device for removing a plug of earth from the ground, said device comprising in combination:
a tubular metal body open at the bottom and top and including a continuous integrally formed wall having a cylindrical shape and a constant diameter, said wall terminating in a circular bottom edge and presenting a hollow interior region of constant volume for receiving the plug in direct contact with the inside surface of said wall, said wall being short enough to permit the foot to be applied to its top with said bottom edge resting on the ground surface;
a plurality of spaced apart teeth on said bottom edge, said teeth tapering from top to bottom and terminating in sharp

lower cutting edges for cutting through the ground when said body is driven into the ground;

a relatively blunt edge on the top of said body adapted to receive the foot to assist in driving said body into the ground; and

a bail formed of hollow metal tubing and curving in a gradual and substantially uniform manner between opposite



ends of the bail, said opposite ends being fixedly pivoted to said body to couple said bail therewith for pivotal movement between a raised position wherein the bail may be manually grasped and twisted as the foot is pressed downwardly on said blunt edge to effect cutting of said teeth through the ground, and a lowered position wherein said bail is located substantially below said blunt edge.

4,135,753

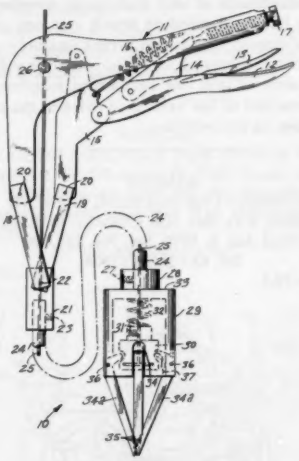
PLUMB BOB RETRIEVER

Adam Acosta, 10260 Bronstein Pl., San Diego, Calif. 92124

Continuation-in-part of Ser. No. 787,207, Apr. 13, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 846,883

Int. Cl.[2] B25J *1/02*

U.S. Cl. 294—115 **2 Claims**



1. A retrieving instrument comprising:

a. A squeeze-action handle having a base member and a squeeze lever member and an over-the-center mechanism causing said base member and squeeze lever member to lock together upon being sufficiently compressed;

b. Said over-the-center mechanism including a brace pivoted at one end to said squeeze lever member and longitudinally buttressed at the other end by an adjusting screw threaded into said base member, whereby the degree of compression at which point said handle locks is variable to vary the force of said jaws on an object gripped thereby;

c. a Bowden wire device comprising:

i. a flexible substantially axially incompressible outer sheath;

ii. a substantially inextensible cable axially movable within said sheath;

d. coupling means connected to said handle and one end of said Bowden wire device for effective relative axial motion between said sheath and cable in response to the squeezing of said handle;

e. a gripping head mounted on the other end of said Bowden wire device and having movable gripping jaws operative between open and closed positions by operating said handle, whereby upon said members being sufficiently compressed, said jaws grip and lock on an object place therebetween.

4,135,754

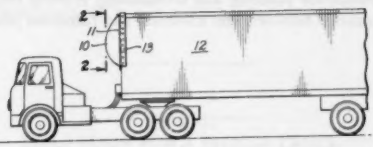
ILLUMINATED AERODYNAMIC ENCLOSURE FOR TRUCKS AND TRAILERS

Joseph M. FitzGerald, and Ruthann P. FitzGerald, both of 8690 Los Coyotes Dr., Buena Park, Calif. 90620

Filed May 31, 1977, Ser. No. 801,581

Int. Cl.[2] B60J *1/04*

U.S. Cl. 296—1 S **1 Claim**



1. In combination with a cargo carrying vehicle having forward, side and top walls, said forward wall being contained in a substantially vertical plane disposed normal to the direction of travel of said vehicle,

an aerodynamic fairing mounted on said forward wall for directing air flow about said vehicle to reduce its aerodynamic drag, said fairing and a major portion of said vehicle being substantially opaque;

means forming a translucent area in at least a forwardly facing portion of said aerodynamic fairing, said translucent area being an integral part of said fairing whereby the surface contour of said translucent area forms a part of the surface of said fairing;

lighting means including at least one electrical socket adapted to receive a light bulb;

bracket means secured to said forward wall of said vehicle within said aerodynamic fairing;

mounting means for said electrical socket, said mounting means being secured to said bracket and extending transversely across said forward wall to support said electrical socket within said aerodynamic fairing and to align said light bulb with said translucent area;

means disposed within said translucent area to form a display to be illuminated; and

means for connecting said electrical socket to the electrical system of said vehicle for illumination of said display.

4,135,755

ARRANGEMENT FOR FLOOR GYMNASTICS

Alfred Steffens, Fluhbergstrasse 7, CH-8708 Mannedorf, Switzerland

Filed Jul. 7, 1977, Ser. No. 813,495

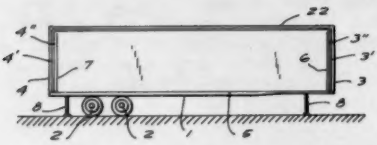
Claims priority, application Switzerland, Jul. 12, 1976, 8930/76; Dec. 16, 1976, 15801/76

Int. Cl.[2] B60Q *3/34*

U.S. Cl. 296—26 **16 Claims**

1. A moving sport arrangement for floor gymnastics, particularly for oriental martial arts, comprising a floor element; a

roof element; a plurality of wall elements including first, second and third wall elements movable between an extended and a retracted position, said wall elements being located in said retracted position in accordion-like relationship with respect to each other and substantially normal to said floor and roof elements, said first wall elements being pivotable relative to said floor element and together with the latter form a floor of the arrangement in said extended position, said second wall



elements being pivotable relative to said roof elements and together with the latter form a roof of the arrangement in said extended position, said third wall elements being located between said first and second wall elements in said retracted position and being translatorily movable in a direction transverse to said floor and roof elements so as to form walls of the arrangement in said extended position; and motor-operated drive means for pivoting and translatorily moving respective wall elements between said extended and retracted positions.

4,135,756

ROLL-OVER PROTECTIVE STRUCTURE FOR VEHICLES AND METHOD OF CONSTRUCTION THEREFOR

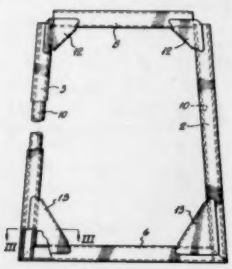
Winfried Hausmann, Klein-Lobke, Fed. Rep. of Germany, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed Dec. 3, 1976, Ser. No. 747,271

Claims priority, application United Kingdom, Dec. 12, 1975, 50963/75

Int. Cl.² B62D *23/00*

U.S. Cl. 296—28 J **5 Claims**



1. A roll-over protective structure for a range of vehicles consisting of a series of outer tubular frame members, at least one inner member fitted within one of the outer members prior to securing of the outer tubular members together to form said frame, whereby the dimensions of the inner member are so chosen as to provide adequate reinforcement for said one outer member to the chosen one of the range of vehicles to which the structure is to be fitted, said inner member co-extensive with said outer member and welded to said outer member at its end.

4,135,757

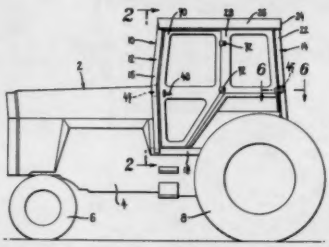
TRACTOR CAB AND SAFETY FRAME MOUNTING

Alfred R. Smith, West Bloomfield, and Jaime Segales, Southfield, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Continuation of Ser. No. 541,910, Jan. 17, 1975, abandoned. This application Sep. 24, 1976, Ser. No. 726,315

Int. Cl.² B62D *27/04*

U.S. Cl. 296—35 R **14 Claims**



1. A vehicle cab suspension for isolating a completely enclosed cab from the vehicle comprising a plurality of upstanding legs connected to form a safety frame around the cab, sides forming a perimeter between the cab top and bottom, a plurality of support members for sole interconnection between said legs and said sides of the cab located within the safety frame, said support members having a first attachment member rigidly affixed to one of said legs projecting toward said cab sides, a second attachment member rigidly affixed to the cab, an elastomeric member interconnecting said attachment members, said elastomeric member supported by one of said attachment members, said one attachment member including a cylindrical portion fixedly attached to said elastomeric member, said cylindrical portion rigid with respect to said one attachment member for attachment of said elastomeric member independently of the forces required to attach said one attachment member to its support member to permit assembly of the suspension without prestressing said elastomeric member by the attachment forces of said one attachment member, and said legs rigidly attached to the vehicle to suspend the cab within the safety frame on the vehicle.

4,135,758

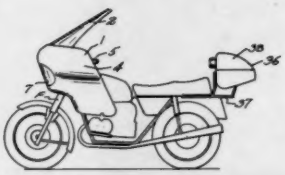
MOTORCYCLE TOURING FAIRING

Vern E. Clements, P.O. Box 608, Caldwell, Id. 83605

Filed Jan. 6, 1978, Ser. No. 867,430

Int. Cl.² B62J *17/04*

U.S. Cl. 296—78.1 **6 Claims**



1. A motorcycle fairing for attachment to the motorcycle frame and including a windshield and comprising,

a fairing member defining a lower frontal opening,

a frontal closure panel on said fairing member and closing said opening and partially defining curvilinear openings through which the motorcycle fork extends, said panel openings permitting normal fork steering movement,

fairing mounting means comprising multiple supports each

removably attached at its lower end to a down-tube of the motorcycle frame, said supports each including a plate adjacent their upper ends for fairing member attachment, and

a dash panel attached to the fairing rearward side and having a flange along its upper terminus for the reception of fasteners extending therethrough and through a windshield lower edge for securement of same to the fairing.

4,135,759

ARMREST FOR PASSENGERS OF MOTOR VEHICLES

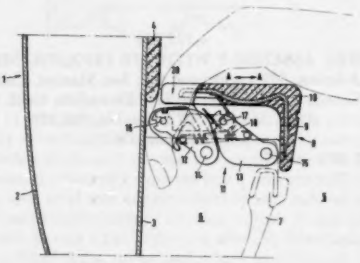
Helmuth Bott, Pforzheim, and Siegfried Nothacker, Kulmbach, both of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed May 12, 1977, Ser. No. 796,383

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623954

Int. Cl.² B60N *1/06*

U.S. Cl. 296—153 **16 Claims**



1. An armrest for passengers of vehicles comprising:

an armrest member and adjustment means for enabling said armrest member to be shifted between two laterally spaced end positions,

wherein said armrest member defines an upper wall of a storage compartment, and wherein said adjustment means is located within said storage compartment.

4,135,760

SLIDING DOOR ASSEMBLY FOR MOTOR VEHICLES

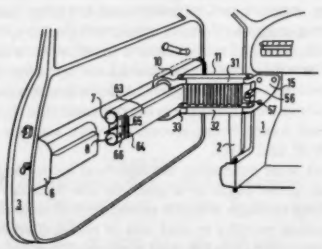
Alfred Grossbach, Lindenstrasse 76, 7146 Tamm, Germany

Filed May 31, 1977, Ser. No. 802,049

Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624296

Int. Cl.² B60J *5/06*

U.S. Cl. 296—155 **22 Claims**



1. In a sliding door assembly for motor vehicles including a supporting system arranged to be supported from a frame of the vehicle and a door carried by said supporting system for longitudinal displacement therein, the improvement wherein said supporting system comprises:

a support arm mounted at one end thereof for pivotal movement about a first vertical axis on the frame of said vehicle;

a multi-part guide head pivotally mounted at the opposite end of said support arm for movement about a second axis parallel to said first axis;

a guide rail assembly mounted on said door extending substantially horizontally over substantially the entire width of said door, said guide rail assembly being cooperatively engaged with said guide head for relative sliding movement therebetween, said guide rail assembly essentially comprising

a pair of tubular members each having at least approximately equivalent diameters and extending generally parallel to each other essentially along the length of said guide rail assembly,

said pair of tubular members being vertically spaced apart a distance not greater than the sum of the diameters of both said tubular members,

with opposite circumferential surfaces of said tubular members forming sliding guides for sliding cooperative engagement with separate parts of said guide head;

said door being displaceable to an intermediate opened position parallel with a closed position through pivotal movement of said supporting system and longitudinally displaceable to a fully opened position by sliding movement of said guide rail in said guide head.

4,135,761

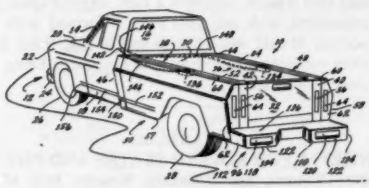
LOAD BODY FOR A PICKUP TRUCK

Charles A. Ward, 2100 Del Amo Way, Bakersfield, Calif. 93305

Filed Apr. 14, 1977, Ser. No. 787,551

Int. Cl.² B62D *33/04*

U.S. Cl. 296—37.6 **4 Claims**



1. In a pickup truck of the type which has a load body including an inner sidewall and an outer sidewall assembly, said outer sidewall assembly including a first top rail and a rear end wall portion, the improvement which comprises:

means swingably connecting said outer sidewall assembly to said truck in spaced relationship to said inner sidewall for forming a compartment between said inner and outer sidewalls, said compartment having an extending portion including a bottom wall, a pair of sidewalls, a top wall and an end wall each of which extends beyond the rear of said load body to a position such that said end wall of said extending portion forms a rear bumper on said truck;

a second top rail affixed to said inner sidewall for coacting with said first top rail to close the top of said compartment; and

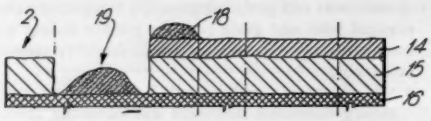
front and rear end pieces closing the front and rear portions of said compartment, respectively, said end pieces being contoured and decorated in a manner such that said front end piece forms a continuation of said outer sidewall assembly appearance wise and said rear end piece conforms approximately to the appearance of a rear end wall portion of said outer sidewall assembly and coacts therewith to close the rear of said compartment when said outer sidewall assembly is swung to a closed position.

4,135,762

QUARRY OPERATION

Vito Biancale, R.R. 2, Dundas, Ontario, Canada

Filed Dec. 8, 1977, Ser. No. 858,918
Claims priority, application Canada, Jul. 5, 1977, 282091
Int. Cl.[2] E21C *47/02, 47/10*
U.S. Cl. 299—13 **16 Claims**



1. Method of operating a quarry area defined by two mutually opposite sides and two mutually opposite ends, said method comprising the steps of:

(a) removing overburden from a first strip of said area, said first strip extending from one of said ends to the other, having a predetermined width and being spaced from one side of said area by a second strip of a predetermined width;

(b) excavating rock from said first strip to thus produce a first trench generally coincident with said first strip;

(c) clearing said second strip of overburden by disposing same into said first trench;

(d) excavating rock from said second strip to thus broaden said first trench to an overall width generally corresponding to the combined width of said first and second strip;

(e) clearing a third strip of said area of overburden by depositing same into said first trench, said third strip having a predetermined width and extending along and in coincident relationship with said first strip at the side thereof remote from said second strip;

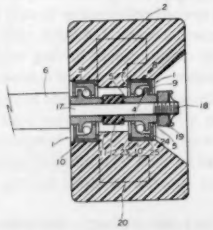
(f) excavating rock from said third strip to further broaden said first trench; whereby a first ridge of spoil, generally coincident with said first strip is formed with at least a portion of said second strip and of said third strip at the sides thereof remote from said first ridge being generally clear of said spoil.

4,135,763

WHEELS FOR ROLLER SKATES AND THE LIKE

Kazuhiro Kosono, and Yasukazu Kosono, both of No. 9-1, Asakusa 7-chome, Taito-ku, Tokyo, Japan

Filed Apr. 29, 1977, Ser. No. 792,287
Claims priority, application Japan, Jun. 16, 1976, 51-78816[U]
Int. Cl.[2] A63C *17/22*
U.S. Cl. 301—5.7 **5 Claims**



1. In a wheel for roller skates and the like, of the kind including:

(i) a wheel body having first and second coaxial sockets each opening at a respective axial end face of the body, and a coaxial centre hole of smaller diameter opening at each end into a respective one of said sockets,

(ii) first and second ball-race bearings each including:

(a) an inner ring having an external flange on its outer periphery,

(b) an outer ring disposed concentrically about said inner ring and having an internal flange on its inner periphery,

(c) a plurality of balls disposed between and contacting said internal and external flanges,

(d) an annular cover having two axially-spaced inturned radial edge portions, said cover being disposed about said outer ring with a first of said inturned edge portions abutting the internal flange of the outer ring, and with the second of said inturned edge portions axially spaced from said external flange of said inner ring,

the improvement that:

(1) an elastic pipe is disposed in said centre hole,

(2) said inner rings each include a hub extending axially through the internal flange of the outer ring, and

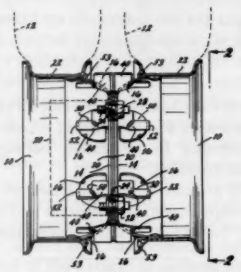
(3) said first and second ball race bearings are disposed respectively in said first and second coaxial sockets with said hubs each abutting a respective axial end of said elastic pipe.

4,135,764

WHEEL ASSEMBLY WITH AIR COOLING MEANS

R. W. Johnson, 559 Larchwood Dr., San Marcos, Calif. 92069, and George E. Day, 1240 N. Ivy, Escondido, Calif. 92026

Filed Jan. 24, 1977, Ser. No. 761,870
Int. Cl.[2] B60B *19/10*
U.S. Cl. 301—6 CS **9 Claims**



1. An assembly including two wheels having dished disks extending from a hub to wheel rims and secured to and supporting said rims and said disks having air openings located at spaced intervals adjacent to said rims, said assembly including tires on said rims and a brake and means securing said disks on said hub, said assembly including air cooling means, comprising:

(a) said wheels being paired with their disks juxtaposed and vane support means interposed between said disks and having a series of vanes supported thereby,

(b) each vane extending from a location between said disks and spaced from an associated air opening, through said associated air opening, to a location spaced from said associated air opening on the opposite side thereof, a series of said vanes being associated with said air openings of each of said disks,

(c) each vane extending through said associated air opening at an acute angle to a plane at the location of the vane passing through the axis of rotation of said wheels as to a direction parallel to said axis of rotation whereby air will be impelled through said associated air opening during forward rotation of said wheels, and each vane being disposed in forwardly directed acute angular relationships to said plane as to a direction perpendicular to said axis of rotation whereby air will be impelled generally toward the centers of said wheels so that part of the air will be directed toward said brakes, and

(d) said support means includes a pair of abutted bodies each

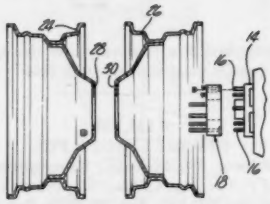
made of plate-like material, one body supporting vanes positioned in the air openings of one disk and the other body supporting vanes positioned in the air openings of the other disk.

4,135,765

WHEEL ADAPTER

Robert L. Hardwicke, Troy, Mich., assignor to Arrowcraft Products, Inc., Troy, Mich.

Filed Feb. 22, 1977, Ser. No. 770,750
Int. Cl.[2] B60B *11/00*
U.S. Cl. 301—36 R **8 Claims**



1. For use in conjunction with a vehicle having an axle with a hub at at least one axial end, said hub having a plurality of outwardly extending circumferentially spaced threaded studs, said threaded studs each having an exposed threaded portion which extends outwardly from the hub a distance sufficient for attaching one axial side of one wheel to said hub, an adaptor for securing two substantially identical wheels to one hub, said wheels each having a flat portion in abutting relationship with the flat portion of the other said wheel, apertures in each of said flat portions, said apertures having the same spacing as said threaded studs, said adaptor comprising:

a tubular and cylindrical housing, said housing having an axial length greater than the length of the exposed threaded portions of the studs;

said housing having a first and second set of circumferentially spaced axial bores formed therethrough, said axial bores having a length substantially equal to the axial length of the housing, wherein said first set of bores register with and receive said exposed portions of said threaded studs therein;

a nut threadably engaging each of said threaded studs to thereby secure one axial end of said housing to said hub;

an elongated threaded member disposed in and through each bore of said second set so that one end of each of said threaded members extends axially outwardly from the other axial end of said housing, said threaded members being longer than the exposed portion of said threaded studs; and

said threaded members extending through the apertures in said abutting flat portions of both of said wheels and a nut threadably engaging each of said elongated threaded members to selectively attach both of said wheels to said housing and thus to said hub and wherein the other axial side of one wheel abuts against the other axial end of the housing.

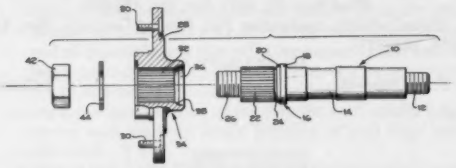
4,135,766

HIGH PERFORMANCE AXLE ASSEMBLY

Gary Trautloff, Bellflower, Calif., assignor to Henry's Machine Works, Anaheim, Calif.

Filed Apr. 7, 1975, Ser. No. 565,468
Int. Cl.[2] B60B *27/06*
U.S. Cl. 301—114 **8 Claims**

1. High performance automotive rear axle assembly comprising an elongated axle shaft of a first metal alloy having a hardness of **58** R_c to **62** R_c and relatively highly resistant to torsional stress, and a separable flange of a second metal alloy having a hardness of **42** R_c to about **48** R_c and resistant to torsional stress and relatively more resistant to bending stress than said first alloy, said flange being splined to said shaft in a plane normal thereto and including structure defining a wheel-mounting bolt hole pattern in said plane, means operatively



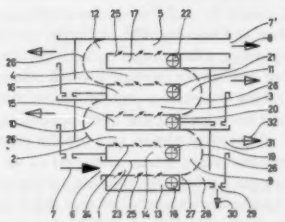
connected to the shaft differentially blocking bending stress displacement of said flange, and fastener means carried by the shaft urging said flange into blocking means engagement against displacement from said plane.

4,135,767

APPARATUS FOR DEHUMIDIFYING SOLIDS BEING TRANSPORTED BY A FLOWING GAS

Hans H. W. Hench, Grossostheim, and Leo K. M. Müller, Mespelbrunn, both of Fed. Rep. of Germany, assignors to Automatik Apparate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,841
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627262
Int. Cl.[2] B65G *53/20;* **F26B** *17/10*
U.S. Cl. 302—31 **3 Claims**



1. An apparatus for dehumidifying solid materials which are being transported by a flowing gas stream, comprising a plurality of pneumatic conveying channel means arranged to form a stack, means operatively interconnecting adjacent ends of said conveying channels to form a meandering flow passage having an inlet port at the bottom end of the stack and an outlet port at the top end of the stack, air supply duct means operatively interposed between adjacent conveying channel means, each air supply duct means having bottom means and cover means arranged in such a manner that a bottom of an air supply duct simultaneously forms the top of the conveying channel next below said air supply duct, said air supply ducts having air slots in the respective cover means slanted in such a direction that the air travels from said bottom end of the stack upwardly to said outlet port at the top end of the stack, said means which operatively interconnect said conveying channel means comprising curved screen means forming guide means from one conveying channel means into the next adjacent conveying channel means, and air outlet means arranged for cooperation with the respective one of said curved screen means whereby air may be partially discharged through said air outlet means along said stack.

4,135,768

ACCELERATOR DEVICE FOR CONTROL VALVE OF AN AIR BRAKE SYSTEM FOR A RAILWAY VEHICLE

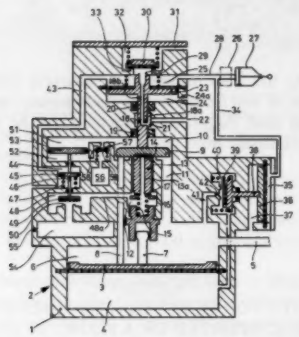
Johann Huber, Munich, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 11, 1977, Ser. No. 850,850

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651377

Int. Cl.[2] B60T *15/02*

U.S. Cl. 303—68 2 Claims



1. In an accelerator device for a three-pressure control valve of an air brake system for a railway vehicle, the combination of a control piston having on one side thereof a first chamber connected to an air line and having on a second side thereof a second chamber, there being a valve chamber, means for defining a first passage between said valve chamber and said first chamber, an accelerator valve in said first passage and operable to an open position by said control piston, there being a transfer chamber having a throttle orifice communicating to the atmosphere, means for defining a second passage between said valve chamber and said transfer chamber, a monitor valve in said second passage, a first piston operatively connected to said monitor valve and having one side thereof communicating to a source of braking pressure, a second piston connected to said first piston and having a first side communicating with said first chamber of said control piston, said second piston movable to close said monitor valve when subjected to air line pressure, said second piston having a second side having a third chamber thereon, and a check valve between said third chamber and air line pressure from said first chamber of said control piston, there being a throttle orifice in said check valve.

4,135,769

ANTI-SKID SYSTEM INCORPORATING MEANS FOR CONTROLLING THE RATE OF RE-APPLICATION OF BRAKE PRESSURE

Geoffrey A. Williams, Coventry, and Keith R. Green, Astley, both of England, assignors to Dunlop Limited, London, England

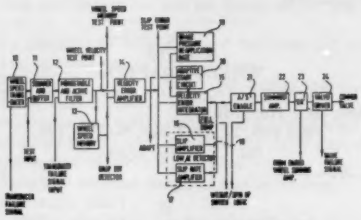
Filed Aug. 24, 1977, Ser. No. 827,240

Claims priority, application United Kingdom, Sep. 3, 1976, 36564/76

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—106 9 Claims

9. A braking system for a vehicle comprising a brake associated with the vehicle and an anti-skid system comprising sensing means operating to compare the speed of the braked wheel with a simulated vehicle speed signal to provide a quasi-slip signal, brake-releasing means responsive to an excessive quasi-slip signal to release the brake, means for initiating re-application of the brake after a brake-releasing operation, and control means for controlling the rate of re-application of brake pressure so that after a predetermined time during which the brake



pressure is re-applied at a relatively low rate the rate of re-application increases progressively with time.

4,135,770

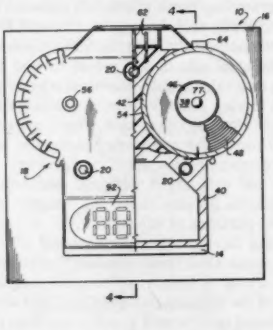
DIE SET LEADER PIN

Norman R. Doherty, 870 Main St., Farmingdale, N.Y. 11735, and Richard F. Doherty, 61 Lion La., Westbury, N.Y. 11590

Division of Ser. No. 681,693, Apr. 29, 1976, Pat. No. 4,056,029. This application Sep. 29, 1977, Ser. No. 837,830

Int. Cl.[2] F16C *1/26*

U.S. Cl. 308—4 C 4 Claims



1. An elongated leader pin for a die set, said leader pin having a bore therethrough and an elongated button slidably positioned in said bore whereby a portion of said button normally extends outwardly from a first end of said leader pin, said bore being longer than the length of said button to enable said button to be fully retracted into said leader pin during the working stroke of the die set, there being further included spring means in said bore for urging said button outwardly of the first end of said leader pin whereby said button urges one section of the die set away from another section of the die set after the working stroke thereof to return said button portion to its normally extended position.

4,135,771

SPHERICAL END BEARING HAVING TWO OR MORE ZONES OF HYDRODYNAMICALLY ACTING GROOVES

Wolfgang Hüber, and Ludwig Feuerer, both of Schweinfurt, Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 16, 1977, Ser. No. 825,173

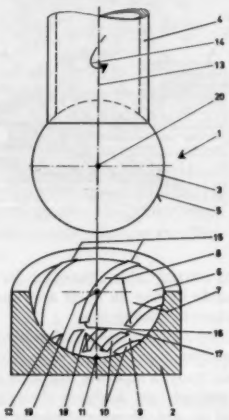
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 7625840

Int. Cl.[2] F16C *17/16*

U.S. Cl. 308—9 6 Claims

1. In a sliding bearing comprising a first member having a convex curved first sliding surface of revolution, and a second member having a correspondingly concave curved sliding surface of revolution into which said first surface is slidably fit

for relative rotation, each of said surfaces having an equator and a pole, and at least one of said surfaces have a first set of grooves therein extending in a direction inclined to the circumferential direction for producing a dynamic fluid current flow in said sliding bearing in the direction from the equator toward the pole upon relative rotation of said first and second members in one rotational sense; the improvement wherein said first



set of grooves extends in a first annular zone from the equator towards the pole and have closed ends toward said pole, and further comprising a second set of grooves inclined in the same rotational sense as said first set and extending in a second annular zone from the vicinity of said pole, the grooves of said first and second annular zones being separated from one another.

4,135,772

BEARING BLOCK FOR BORING TURBINE

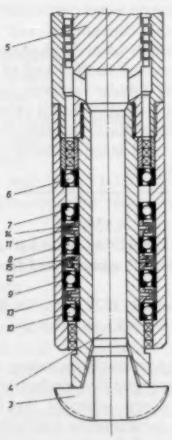
Enno Stodt, Heidenheim, Fed. Rep. of Germany, assignor to Voith Getriebe KG, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 821,715

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636048

Int. Cl.[2] B62B *19/02*

U.S. Cl. 308—227 **7 Claims**



1. A bearing block for a boring turbine, comprising a block housing with a boring tool shaft passing therethrough and rotatable in said housing; a boring tool on an end of said shaft;

a plurality of axially spaced apart rotation bearings in an axial array for permitting rotation of said shaft in said housing; a first said bearing at one end of the axial array thereof being connected with said block housing for transmitting force thereto; a second said bearing at the opposite end of the axial array thereof being nearer to said tool and being connected with said shaft for having force transmitted to said second bearing from said shaft;

a respective intermediate spring ring between axially neighboring said bearings, and a plurality of said rings being provided;

each said ring being deflectable under force applied by said shaft to said second bearing; each said ring being deflectable under force through a gradually increasing level of force until that said ring reaches a deflection level at which further force on said shaft does not cause further deflection of that said ring and that said ring thereafter permitting a constant flow of force;

each said ring nearer said tool having a greater resistance to deflection than the said ring next further from said tool; said rings having respective deflection characteristics such that the said rings are deflected in a stepped manner starting with said ring furthest from said tool as the axial force on said shaft increases.

4,135,773

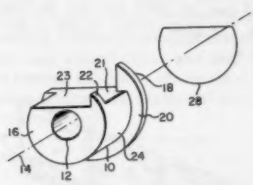
SNAP-FITTING

John G. Van Remoortel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 28, 1977, Ser. No. 820,045

Int. Cl.[2] 403 *365;* **F16C** *33/00*

U.S. Cl. 308—238 **6 Claims**



1. A snap fitting comprising: a unitary article of a resilient polymeric material having an axis and a peripheral surface, said article having first and second faces generally perpendicular to said axis, said peripheral surface being annular except where interrupted by at least one flat portion thereon extending axially from said first face to said second face, said peripheral surface having at least one flange section perpendicular to said axis, said flange section also being interrupted by said flat portion and defining an edge of said first face of said article, said peripheral surface having at least one protuberance defining an edge of said second face.

4,135,774

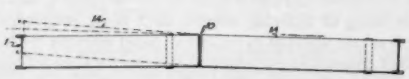
JOINTING MEMBERS AND JOINTS

Adrain Senior, and Richard Gilman, both of Barnsby, England, assignors to Pioneer Works, Barnsby, England

Filed Nov. 29, 1977, Ser. No. 855,700

Int. Cl.[2] H01R *39/00*

U.S. Cl. 339—7 **8 Claims**



1. An articulated electrical joint, comprising in combination;

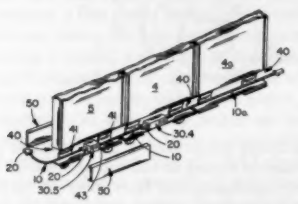
a pair of electrical conductors for supplying electrical energy to mine equipment, each, of said conductors having a square C cross section defined by a rear wall, a pair of upstanding ends formed, respectively on opposite edges of said rear wall, and a pair of inturned lips formed, respectively, on said upstanding ends; a unitary jointing member having an I cross-section defined by first and second parallel cheeks interconnected by a central stem portion; said jointing member being mutually engaged with said conductors with said first cheek being located within said conductors, with said first cheek having a dimension, in its direction of parallelism, such that there is established an articulation space beyond opposite ends of said first cheek, and with said stem portion extending outwardly between the inturned lips of said conductors; and at least one resilient, electrically conductive member interposed between said jointing member and the rear walls of said conductors; the length of the stem portion of said jointing member being greater than the thickness of the lips to establish a further articulation space between the inturned lips of said conductors and the second cheek of said jointing member; whereby said joint is capable, while carrying current, of simultaneous vertical and horizontal articulation as well as extension or retraction in the longitudinal direction.

4,135,775

MOVABLE DIVIDER PANELS WITH ELECTRICAL WIRING

Richard P. Driscoll, Kentwood, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 20, 1977, Ser. No. 807,906
Int. Cl.[2] E04F *17/08;* **H01R** *13/60*
U.S. Cl. 339—22 R **3 Claims**



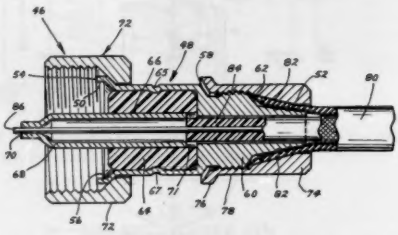
1. A movable room divider panel system comprising: at least two movable panels of differing widths from one end edge to the other, each including an accessible raceway therethrough and a readily releasably mounted cover over said raceway whereby said cover can be removed to allow access to said raceway; an outlet box positioned within each said raceway having at least one electrical outlet; said outlet box and said raceway having relative dimensions which allow communication wiring to be placed within said raceway in addition to said outlet box; at least one electrical connector at each end of said electrical outlet; electrical wiring and flexible conduit enclosing said electrical wiring and having an electrical connector at each end of said conduit capable of matingly engaging said electrical connectors in said outlet boxes whereby said flexible conduit can be located within said raceways and used to electrically connect said outlet boxes in said two panels; said outlet boxes being of differing lengths, each being proportional in length to said width of its respective panel whereby the flexible conduit connectors employed to join electrical outlet boxes in adjacent panels can be of a uniform length regardless of the width of the adjacent panels.

4,135,776

SOLDERLESS COAXIAL CABLE CONNECTOR

Manohar L. Ailawadhi; James H. Ryan, and Chander M. Wahi, all of Waseca, Minn., assignors to E. F. Johnson Company, Waseca, Minn.

Filed Jan. 28, 1977, Ser. No. 763,367
Int. Cl.[2] H01R *17/04*
U.S. Cl. 339—177 R **1 Claim**



1. Solderless coaxial cable connector for terminating an end of a coaxial cable having an outer and inner conductor separated by a dielectric comprising:

a. a conductive cylindrical body having two ends, a gradual increasing flare connecting a large diameter means to one end of said body, a tapering diameter means connected to another end of said body, a threaded diameter means connected to said tapering diameter means, a second tapering diameter means connected to said threaded diameter means, and a small tapering diameter means connected to said second tapering diameter means, said small tapering diameter means having a more gradual taper than said second diameter means;

b. an integral tubular insulator securely held internal to said body by contact with indentation means in said body and having a central bore;

c. a center contact securely held internal to said central bore, protruding outwardly a distance beyond said large diameter means;

d. a conical end on said protruding end of said center contact;

e. a thumb nut means having a diameter to fit over said body; and,

f. a sleeve means to thread onto said threaded diameter means of said body whereby said outer conductor of said coaxial cable is sandwiched between said threaded diameter means of said body and said sleeve means by said sleeve means when threaded onto said threaded diameter means, said dielectric is accommodated internally in said body between the distance of said tapering diameter means and said small tapering diameter means and in an internal space between another end of said center contact and an end of said tubular insulator, said inner conductor fits into said center contact and is crimped at said conical end of said center contact, and said thumb nut is retained on said body by said large diameter means of said body and said sleeve means.

4,135,777

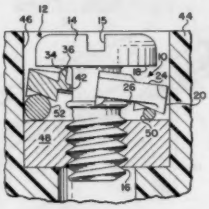
TILTABLE TERMINAL CLAMP ASSEMBLY

Gerald D. Barth, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 20, 1978, Ser. No. 870,977
Int. Cl.[2] H01R *9/10*
U.S. Cl. 339—246 **12 Claims**

1. A terminal clamp assembly including screw member with a head, a plate-like polygonally configured clamping member preassmbled to the screw adjacent the head, the clamping member including a substantially centrally disposed aperture with the upper region of the shank of the screw member extending therethrough, the clamping member undersurface

having a plurality of radially directed ribs extending from adjacent the aperture to the outer periphery of the clamping member, the plurality of ribs including alternately disposed sets of ribs, the ribs of a first set tapering inwardly from a maximum



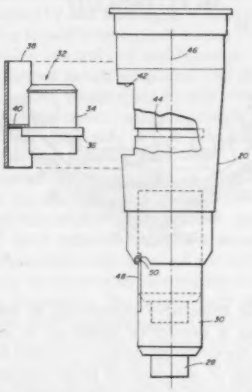
height adjacent the outer periphery of the clamping member to a minimum height adjacent the aperture, the ribs of a second set tapering outwardly from a maximum height adjacent the aperture to a minimum height adjacent the outer periphery of the clamping region.

4,135,778

MICROSCOPE LENS SYSTEM

F. William Lincoln, Cohasset, Mass., assignor to Lincoln Associates, Inc., Cohasset, Mass.

Filed Dec. 15, 1976, Ser. No. 750,856
Int. Cl.[2] G02B *7/14*
U.S. Cl. 350—38 **7 Claims**



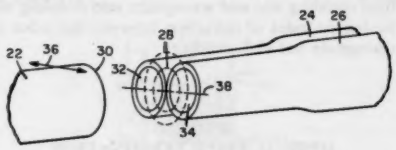
1. A microscope including
a tube having an optical axis;
objective lens means;
means for supporting said objective lens means at said optical axis of said tube;
eyepiece lens means;
an opening in the wall of said tube accessible from the exterior of the microscope for receiving said eyepiece lens means; and
means for supporting said eyepiece lens means at said optical axis spaced apart therealong from said objective lens means comprising
a clip member of predetermined cross section gripping said eyepiece lens means at the periphery thereof and
a receptacle within said tube adjacent said opening sized to receive said clip member and to retain said clip member at a fixed longitudinal location in said tube; and
light shield means supportable adjacent said opening in said tube wall
whereby said eyepiece lens means rapidly and accurately placeable in, and removable from, said tube.

4,135,779

VARIABLE RATIO OPTICAL JUNCTION DEVICE

Marshall C. Hudson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 2, 1976, Ser. No. 711,104
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.15 **3 Claims**



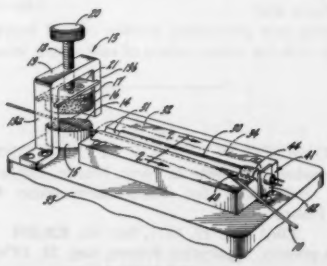
1. An optical junction device comprising first, second and third optical fibers,
each comprising a core of transparent material surrounded by a layer of transparent cladding material having a refractive index lower than that of said core material, the end portions of said first and second fibers being fused together in side-by-side relationship, said end portions of said first and second fibers being fused together to such an extent as to form a single composite fiber having two cores therein, the cladding layers of said first and second fibers combining to form a single cladding layer of elliptical cross section,
the endfaces of said first and second fibers being substantially coplanar and being substantially perpendicular to the fiber axes,
means for supporting the end portion of said third optical fiber so that its axis is substantially parallel with the axes of said first and second fibers and its endface is substantially perpendicular to the axis thereof and is disposed against the endfaces of said first and second fibers, and
means for causing relative movement between the endfaces of said first and second fibers and said third fiber, said movement causing the center of said third fiber to traverse a line passing through the centers of the endfaces of said first and second fibers.

4,135,780

OPTICAL FIBER TAP

Richard B. Dyott, London, England, assignor to Andrew Corporation, Orland Park, Ill.

Filed May 17, 1977, Ser. No. 797,673
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.15 **12 Claims**



1. An optical fiber tap for tapping optical signals from an optical fiber having a core for guiding optical signals along the fiber and a cladding surrounding the core, said tap comprising the combination of
(a) means for applying pressure to preselected points on said fiber to couple optical signals from the fiber core into the fiber cladding,
(b) an optical waveguide positioned adjacent to a sidewall of

said fiber for collecting light signals from the fiber cladding without cutting the fiber, said optical waveguide having an index of refraction and cross sectional area greater than the index of refraction and cross sectional area of said cladding,

(c) and a coupling material interconnecting said fiber and optical waveguide for conducting light signals from the fiber cladding into said waveguide, said coupling material having an index of refraction between the index of said waveguide and said cladding.

4,135,781

OPTICAL FIBER TERMINATION

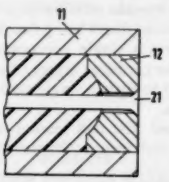
John D. Archer, Halifax, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,262

Claims priority, application United Kingdom, May 25, 1976, 21636/76

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.20 **2 Claims**



1. A method of terminating a plastic clad optical fiber with a connector member of the type having a ferrule adapted to receive the clad fiber and a pierced watch bearing jewel mounted in the ferrule for locating a bared end of said fiber, the aperture through said watch jewel having an outer conical throat, comprising the steps of:

heating said ferrule to the softening temperature of the plastic cladding of said fiber;

inserting said clad fiber into said ferrule so as to deform said plastic cladding until a bared end of said fiber protrudes through the aperture in said watch jewel;

cooling said ferrule and clad fiber;

fusing said protruding portion of said bared fiber so as to engage the wall of the jewel aperture and deforming said fused portion against said watch jewel to fill said conical throat to thereby center said bared fiber in said jewel aperture; and

machining said protruding portion of said bared fiber end flush with the outer surface of said watch jewel.

4,135,782

CONNECTION BAR FOR OPTICAL FIBRES

Pierre Beauhaire, Meudon la Foret, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

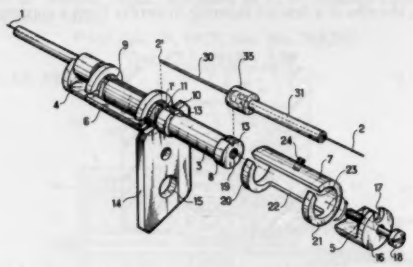
Filed Aug. 19, 1977, Ser. No. 826,098

Claims priority, application France, Aug. 25, 1976, 76 25769

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.21 **10 Claims**

1. A connection bar for optical fibres, comprising an alignment support having at least one groove for receiving the ends of each pair of fibres to be connected and means for holding the fibres in their grooves, the improvement wherein: said alignment support is constituted by a cylindrical part on which said at least one groove is disposed along a generating line and said holding means are constituted by a ring installed around the support, the ring being split longitudinally for the insertion of each end of fibre in its groove and means for rotatably



mounting said ring about said support to provide the transversal positioning of the ends of each pair of fibres.

4,135,783

DEVICE FOR FORMING A DETACHABLE CONNECTION BETWEEN A WAVEGUIDE AND ANOTHER OPTICAL COMPONENT

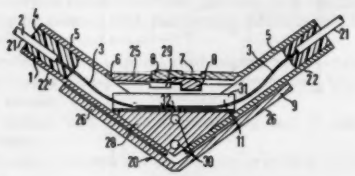
Dieter Kunze, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 16, 1977, Ser. No. 797,245

Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622607

Int. Cl.[2] G02B 5/14

U.S. Cl. 350—96.21 **10 Claims**



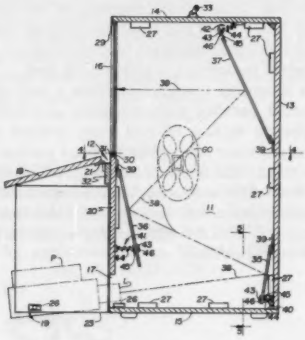
1. A device for detachably connecting at least one light waveguide having a protective sheathing to another light waveguide, said device comprising a coupling section and a pair of plugs, each of said pair of plugs comprising a base member having a trough-shaped cross section with a pair of spaced, upstanding shanks at one end of the base member and a flap member secured to said base member with a portion covering the space between the pair of shanks at said one end of the base member and being movable from a position covering said shanks, each of said plugs receiving at least one light waveguide and engaging the protective sheathing so that the waveguide is secured therein with a free end of the waveguide, which end has the protective sheathing removed, extending between the spaced shanks at said one end of the base member, said coupling section having a pair of separate means for guiding a plug in a linear path as it is inserted into the coupling section, each of said separate means for guiding being a plug guide having a trough-like cross section for slidably receiving the plug, and means forming a centering groove being disposed between the pair of plug guides and extending into the path of each plug at an acute angle thereto so that as each of the plugs is inserted into the coupling section, the free end of each of the waveguides secured therein is received in a centering groove and deflected thereby to move therealong to a position for forming an optical contact with a waveguide carried by the other plug of the pair of plugs.

4,135,784

REAR SCREEN OPTIC PROJECTION APPARATUS

Robert B. Larrick, 1450 Hawthorne Ave., Columbus, Ohio 43203

Filed Aug. 10, 1977, Ser. No. 823,514
Int. Cl.[2] G03B 21/56
U.S. Cl. 350—122 15 Claims



1. A rear screen viewing apparatus for use with visual image projection devices comprising

a support housing of elongated tubular configuration having a longitudinally extending peripheral wall structure and an end closure wall at each end thereof,

a viewing screen mounted in said peripheral wall structure and supported by said housing in longitudinally extending relationship to said housing, said screen having an imaging surface facing inwardly of said housing,

an aperture formed in said peripheral wall structure in longitudinally spaced relationship to said viewing screen for projection of an optical image interiorly of said housing from a visual projection device positioned substantially exteriorly of said housing, and

an optical system for transmitting an optical image along a path from the visual image projection device and onto the imaging surface of said viewing screen, said optical system including three reflectors disposed in relatively axially spaced relationship with a first of said reflectors disposed in relatively axially spaced relationship with a first of said reflectors disposed in the optical path of an image projected from said visual projection device to first receive the image thus projected, a second of said reflectors disposed in the optical path to reflect an image substantially normal to said imaging surface, and a third of said relectors disposed relative to said first and second reflectors for transmitting of an optical image from the first to the second reflectors,

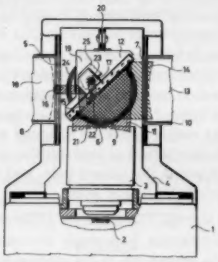
said support housing including a plurality of door elements which are mounted thereon for pivoted, swinging movement between a position in closed relationship to said housing and a relatively open position cooperatively forming a light shield for a visual image projection device that may be disposed immediately in front of said housing at said aperture, said plurality of door elements including a first door mounted on said housing vertically above said aperture by hinge means for pivoting of the first door about a horizontal axis between a closed, vertically extending position and an open, laterally outward projecting position, and a second door having two sections mounted on said housing at opposite sides of said aperture by respective hinge means for pivoting of each section about a vertical axis between a closed position with respect to said housing and an open, laterally outward projecting position, said first and second doors forming an inverted, U-shaped channel when in an open configuration and thereby forming said light shield.

4,135,785

X-RAY LIGHT DIVIDER

Kálmán Bernolák, and Sándor Mészáros, both of Budapest, Hungary, assignors to Medicor Müvek, Budapest, Hungary

Filed Aug. 25, 1977, Ser. No. 827,686
Claims priority, application Hungary, Aug. 25, 1976, ME2012
Int. Cl.[2] G02B 27/14
U.S. Cl. 350—172 6 Claims



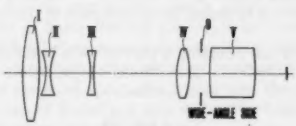
1. An X-ray light divider for equipment fitted with an image intensifier (1) having an exit screen (2) and collimator optics (3), having an optical axis, in the path of the emitted light beam, the divider comprising: a slit mirror (12) being reflecting and non-transparent over substantially its entire area, yet having thereon at least two gaps (15, 22) which are transparent and non-reflecting, said slit mirror being centered onto the optical axis and supported by first pivoting means (19) at an angle of approx. 45° with respect to the axis; and at least one reflecting optical element (17) adjacent said gaps; second means (19) for pivoting said element with said slit mirror also about the axis, for deflecting the light beam that passes through said gaps, with a surface of said element substantially perpendicular to said area of the slit mirror; thereby forming at least three light channels (5, 6, 7) of which one (5) receives a light beam by reflection from said area of the slit mirror, while at least two other channels (6, 7) obtain respective light beams by way of said gaps.

4,135,786

ZOOM LENS SYSTEM

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,777
Claims priority, application Japan, Feb. 26, 1976, 51-020473
Int. Cl.[2] G02B 15/18
U.S. Cl. 350—184 2 Claims



1. A zoom lens system comprising:

a first lens part having a positive refractive power, being comprised of a plurality of lens elements, and having a focusing function, said first lens part being fixed during zooming;

a zooming lens part being comprised of a front movable lens group, a middle movable lens group and a rear movable lens group, and being positioned on the image side of said first lens part;

said front movable lens group having a negative refractive power, and

said rear movable lens group having a positive refractive power;

a prime lens part having a positive refractive power, being comprised of a plurality of lens elements, and being positioned on the image side of said zooming lens part;

the three movable lens group being moved simultaneously and independently of each other during zooming;

said front movable lens group being moved toward the image side, and

said rear movable lens group being moved toward the object side as the focal length of the entire system is increased;

said front movable lens group and said middle movable lens group being spaced by a shortest distance when the focal length of the entire system is longest; and

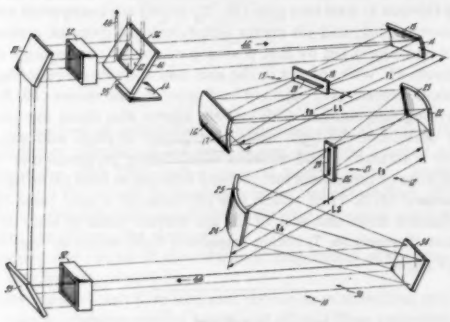
wherein the front surface of said middle movable lens group is concave toward the object side, and the rear surface is convex toward the image side.

4,135,787

UNSTABLE RING RESONATOR WITH CYLINDRICAL MIRRORS

George H. McLafferty, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 27, 1977, Ser. No. 819,431
Int. Cl.[2] H01S *3/083*
U.S. Cl. 350—294 **15 Claims**



1. A ring resonator for providing an output beam of electromagnetic radiation having a central region with low intensity in the near field comprising:

a first region including a first filtering section having a first mirror and a second mirror, both with curved reflected surfaces, and a first spatial filter positioned between the first and second mirrors;

a second region, capable of accommodating a gain medium, including a turning mirror cooperating with the first filtering section to define an optical path of the ring resonator; and

means for out coupling a portion of a beam of electromagnetic radiation to provide the output beam.

4,135,788

CYCLE HANDLEBAR REAR VIEW MIRROR ASSEMBLY

Albert Sargis, 70 Grove Hill, Apt. 4W, New Britain, Conn. 06052

Filed Oct. 3, 1977, Ser. No. 838,678
Int. Cl.[2] G02B *5/10*
U.S. Cl. 350—307 **9 Claims**

1. A mirror assembly for mounting in the end of a tubular handlebar of a cycle or the like comprising:

A. an insert member of synthetic resin having:

(1) a collar portion dimensioned to abut the outer end of the handlebar,

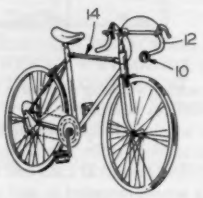
(2) a shank portion extending in one direction from and of lesser diameter than said collar portion, said shank portion being adapted to frictionally engage within the handlebar, and

(3) a mounting post extending in the opposite direction from said collar portion and having a generally spherical head portion;

B. a mirror mounting member having:

(1) a generally cylindrical body portion with a cavity of circular cross-section opening on one surface thereof, the wall of said body portion defining said cavity having a reduced diameter portion adjacent the outer end thereof to define a peripheral lip, and

(2) a mounting portion including a pair of transversely spaced, paralled walls extending perpendicularly to the opposite surface of said body portion and receiving therebetween said spherical head portion of said insert member, said walls having aligned recesses in the opposed surfaces thereof spaced outwardly from said body portion and having said spherical head portion seated therein for substantially universal pivotal movement therewithin;



C. clamping means on said walls of said mirror mounting member for releasably clamping said walls together about said spherical head portion to establish the clamping pressure and thereby the frictional resistance to said universal pivotal movement;

D. a circular mirror of plate-like, concavo-convex configuration seated in said recess of said mirror mounting member and arching outwardly thereof, said mirror having its periphery extending under said lip of said recess; and

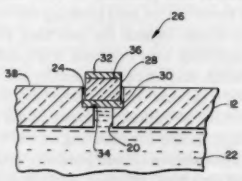
E. a resiliently compressible synthetic resin backing member of concavo-convex configuration, said backing member extending in surface contact over at least the major portion of the inner surface of said mirror and being adhered to the inner surface of said mirror over substantially their entire opposing surfaces, said backing member bearing upon the bottom wall of said body portion of said mirror mounting member defining said cavity and biasing the outer face of said mirror against said peripheral lip.

4,135,789

SEAL FOR LIQUID CRYSTAL DISPLAY

James K. Hall, Scottsdale, Ariz., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 1, 1977, Ser. No. 812,201
Int. Cl.[2] G02F *1/01*; C09K *3/34*; B32B *3/26, 27/00*
U.S. Cl. 350—343 **14 Claims**



1. A sealing arrangement for an aperture in a glass wall

portion of an enclosure containing a prescribed material, said arrangement comprising:

a glass bead disposed in said aperture, said glass bead being fused within said aperture; and

an insulating pad disposed in said aperture between said glass bead and said prescribed material, said pad being chemically inert to avoid adverse chemical reactions when in contact with said glass bead and said prescribed material, said pad being made of a high temperature elastomeric material low in thermal conductivity to impede the transfer of heat to said prescribed material to inhibit prescribed material when said glass bead is being fused within said aperture by an external heat source.

4,135,790

ELECTROCHROMIC ELEMENT

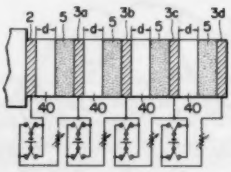
Youske Takahashi, and Hideki Akasaka, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,486

Claims priority, application Japan, May 14, 1976, 51-55073

Int. Cl.[2] G02F *1/23*

U.S. Cl. 350—357 **5 Claims**



1. An electrochromic element comprising a composite cell composed of a lamination of a plurality of unit cells at least in partial registry with one another, each of said unit cells having a pair of transparent electrodes at least in partial registry with one another and an electrochromic material filling a space between said transparent electrodes, and a transparent substrate for supporting said composite cell.

4,135,791

REDUCED GLARE SCANNER

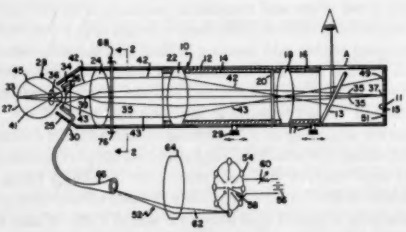
Jacques P. Govignon, Malden, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 528,740, Dec. 2, 1974, abandoned. This application May 18, 1977, Ser. No. 797,983

The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.

Int. Cl.[2] A61B *3/14*

U.S. Cl. 351—7 **31 Claims**



1. Apparatus for reduced glare observation of an article through transparent, partially reflective and diffusive media wherein said media is located proximate said article and between said apparatus and said article, which apparatus comprises, an image receiving means; illumination means which directs an unfocused beam of light onto said article; light directing means to direct said light beam to rapidly and repeatedly illuminate successive portions of said article, which light is reflected from said article through said media to said image receiving means; an observation diaphragm positioned between said media and said image receiving means in the path of the above reflected light removed from and proximate to a focused image zone of said article, said diaphragm having a moveable aperture for moving in concert with said light directing means so as to rapidly scan the sequentially illuminated portions of said article, the remainder of said diaphragm screening out glare and means for moving said light directing means and said diaphragm aperture in synchronization.

26. A method for reduced glare observation of the fundus of an eye through transparent, reflective and diffusive media comprising, directing scanning light to rapidly illuminate successive portions of said fundus repeatedly, admitting the reflected light from the then illuminated portion of said fundus to an image receptor while blocking substantially all the glare and reflected and diffused light from the rest of the scanned portion of said fundus by moving a diaphragm across the path of said reflected light, removed from and proximate to a focused image zone of said article so as to obtain a clear image of substantially all the scanned portion of said fundus by rapid observation scanning of the sequentially illuminated portions thereof.

4,135,792

ALL PLASTIC SPECTACLES

Emil W. Deeg, Woodstock, Conn., and Edward A. Travnicek, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 659,809, Feb. 20, 1976, abandoned. This application Aug. 11, 1977, Ser. No. 823,563

Int. Cl.[2] G02C *1/00, 1/08, 5/00*

U.S. Cl. 351—41 **5 Claims**

1. In the art of manufacturing spectacles with frame fronts having plastic lens supporting rims and plastic lenses supported therein, the invention comprising:

a series of plastic spectacles with rim and lens material combinations having compatible tensile elastic moduli and coefficients of linear thermal expansion for avoidance of spectacles lens loosening and warpage due to tightening in supporting rims under changes in environmental temperatures, said series of spectacles comprising the particular combinations of frame and lens materials charted by the symbols X in the following Table I

TABLE I

	Lens Materials	
	Cast Acrylic (PMMA)	Poly Carbonates (unfilled)
	E = 3.5 -4.5	E = 3.0 -3.5
Frame Materials	α = 5.0 -9.0	α = 6.6
	n = 1.48 -1.50	n = 1.586
Acetal Homopolymer E = 5.2 α = 8.1	X	X
ABS - clear (acrylonitrile-butadiene-styrene) E = 2.9	X	X

TABLE I-continued

α = 8.3 ABS - high impact (acrylonitrile-butadiene-styrene) E = 2.4 -3.4 α = 9.0 -13.0	X	
ABS - medium impact (acrylonitrile-butadiene-styrene) E = 3.0 -4.5 α = 8.0 -10.0	X	
ABS - high heat resistant (acrylonitrile-butadiene-styrene) E = 2.9 -4.2 α = 6.0 -9.3	X	X
Epoxy - cast unfilled (diglycidal ether of bisphenol A) E = 3.5 α = 4.5 -6.5	X	X
Epoxy - flexibilized (diglycidal ether of bisphenol A) E = 0.1 -3.5 α = 2.0 -10.0	X	X
Polycarbonate (unfilled) E = 3.0 -3.5 α = 6.6	X	X
Polyvinylchloride (rigid) E = 3.5 -6.0 α = 5.0 -10.0	X	X
Allyldiglycolcarbonate (clear) E = 3.0 α = 8.1 -14.3	X	X
Cellulose acetate E = 0.65 -4.0 α = 8.0 -18.0	X	X

Frame Materials	Lens Materials: Polystyrene (unfilled) E = 4.0 -6.0, α = 6.0 -8.0, n = 1.59 -1.60	Lens Materials: Allyldiglycol-carbonate E = 3.0, α = 8.1 -14.3, n = 1.50
Acetal Homopolymer E = 5.2 α = 8.1	X	X
ABS - clear (acrylonitrile-butadiene-styrene) E = 2.9 α = 8.3		X
ABS - high impact (acrylonitrile-butadiene-styrene) E = 2.4 -3.4 α = 9.0 -13.0		X
ABS - medium impact (acrylonitrile-butadiene-styrene) E = 3.0 -4.5 α = 8.0 -10.0	X	X
ABS - high heat resistant (acrylonitrile-butadiene-styrene) E = 2.9 -4.2 α = 6.0 -9.3	X	X
Epoxy - cast unfilled (diglycidal ether of bisphenol A) E = 3.5 α = 4.5 -6.5		
Epoxy - flexibilized (diglycidal ether of bisphenol A) E = 0.1 -3.5 α = 2.0 -10.0	X	X
Polycarbonate (unfilled) E = 3.0 -3.5 α = 6.6	X	
Polyvinylchloride (rigid) E = 3.5 -6.0 α = 5.0 -10.0	X	X
Allyldiglycolcarbonate (clear) E = 3.0 α = 8.1 -14.3		X
Cellulose acetate E = 0.65 -4.0 α = 8.0 -18.0	X	X

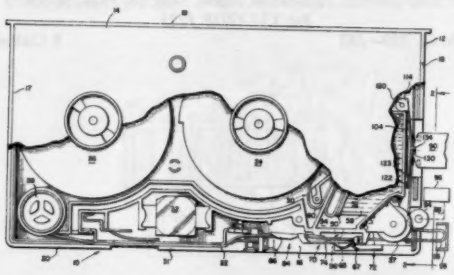
E = tensile elastic modulus in psi . 10^{-5}
α = coefficient of linear thermal expansion in (degr. C)$^{-1}$. 10^{-5}
n = refractive index

4,135,793

TRANSDUCER BACKUP ASSEMBLY FOR SOUND MOTION PICTURE FILM HANDLING CASSETTE

Paul W. Thomas, Duxbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 4, 1977, Ser. No. 756,623
Int. Cl.[2] G03B *31/02*
U.S. Cl. 352—27 **7 Claims**



1. A sound motion picture film handling cassette adapted to be mounted in a photographic apparatus and to be engaged by transducer means, said transducer means having a magnetic pickup/recording head and being movable between an idle position and an operative position, said cassette comprising:

a housing having an opening provided therein to permit said transducer means to be introduced thereinto when moved to its said operative position;

a strip of photographic film coiled within said housing for translation along a predetermined path therethrough, one side of said film having a magnetic sound track adjacent one edge thereof and facing outwardly of said housing;

a film support member having two ends spaced apart a distance at least as great as the width of said film strip;

resilient means mounting said support member in said housing for engaging and supporting said film and imparting a biasing force upon said support member to bias said film strip into engagement with said transducer means with said magnetic sound track in engagement with said magnetic head when said transducer means is in its said operative position, said resilient means comprising a leaf spring mounted within said housing behind said support member and having first and second ends, said leaf spring being bowed outwardly toward said support member and being attached to said housing at said first end thereof;

means for attaching said leaf spring to said support member, said means for attaching engaging said support member at the ends thereof and said means for attaching being attached to said leaf spring at only the end of said means for attaching adjacent said magnetic sound track of said film strip; and

wherein said cassette includes means for supporting said second end of said leaf spring for unrestrained sliding motion substantially in the direction of travel of said film strip, whereby a significantly greater biasing force is imparted upon the backside of said film strip adjacent said one edge than upon the other portions of said film strip in engagement with said transducer means.

4,135,794

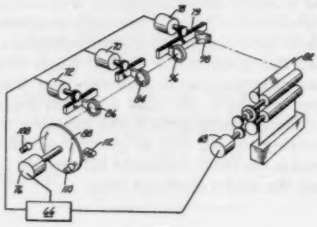
PHOTOCOMPOSITION MACHINE

Francis S. Szabo, Morristown, and George G. Pick, Mendham, both of N.J., assignors to Addressograph-Multigraph Corporation, Los Angeles, Calif.

Continuation of Ser. No. 576,382, May 12, 1975, abandoned. This application Sep. 2, 1977, Ser. No. 830,129

Int. Cl.[2] B41B *13/00*

U.S. Cl. 354—5 12 Claims



1. In a photocomposition machine including font means for providing at least one font of a plurality of characters, projection light source means for successively illuminating preselected characters of said font means so that the characters are projected along an optical axis, a photosensitive receiving sheet, and input means for generating point size data representative of the point size of a character selected by an operator for photocomposition from a plurality of available point sizes, improved apparatus for accurately focusing characters at the selected point size onto the receiving sheet comprising:

variator lens means for successively forming a plurality of aerial images representing a plurality of degrees of magnification of said preselected characters by movement of said variator lens means parallel to the optical axis into a plurality of different composing positions determined by the point size data;

collimator lens means movable parallel to the optical axis into a plurality of different composing positions determined by the point size data in which the aerial image forms an object for the collimator lens means, so that collimated light rays are formed;

decollimator lens means responsive to the collimated light rays for focusing a print image corresponding to the aerial image on the receiving sheet and for moving parallel to the optical axis to provide escapement for the preselected characters;

means for defining a first reference position and a second reference position; and

means for driving the variator lens means to the first reference position in a predetermined direction and driving the variator lens means from the first reference position to a first one of said composing positions determined by said point size data only in a direction opposite the predetermined direction in which the variator lens means is driven to the first reference position, and for driving the collimator lens means to the second reference position in a predetermined direction and driving the collimator lens means from the second reference position to a second one of said composing positions determined by said point size data only in a direction opposite the predetermined direction in which the collimator lens means is driven to the second reference position, whereby the reliability with which the illuminated character is focused onto the receiving sheet is increased.

4,135,795

DIGITAL INDICATOR DEVICE FOR INDICATING PHOTOGRAPHING EXPOSURE VALUES IN THE FORM OF DIGITS

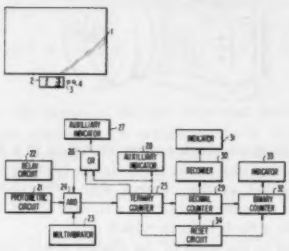
Naoyuki Uno, Urawa; Tetsuji Shono, Ranzan; Fumio Urano, Omiya; Masahiro Kawasaki, Tokyo, and Katsuhiko Nomura, Kawagoe, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 633,998, Nov. 20, 1975, abandoned. This application Jul. 12, 1977, Ser. No. 814,944

Claims priority, application Japan, Nov. 22, 1974, 49-141766[U]

Int. Cl.[2] G03B *17/20*

U.S. Cl. 354—23 D 7 Claims



1. An exposure value visual indicating system in a camera having a viewfinder for viewing an image of a scene to be photographed, said system comprising:

(a) electronic circuit means for generating a time period signal proportional to the exact Apex exposure value,

(b) a source of clock pulses having a frequency selected to provide K clock pulses within a time period of said time window corresponding to one full Apex exposure value step, where K is a whole number greater than 1,

(c) means responsive to said time period signal and said clock pulses to provide at an output thereof the clock pulses occurring during the duration of said time period,

(d) counter means, including a divide-by-3 counter and a first divide-by-10 counter for separately counting the number of complete sets of three pulses at said output and the remaining pulses at said output, said divide-by-3 counter comprising a binary counter for counting the binary sequence 00, 01, 10, said binary counter being responsive to said pulse for counting from 0 to K−2, and providing an overflow pulse each time it recycles from K−1 to 0, said first divide-by-10 counter being responsive to said overflow pulses for counting from 0 to 9 and for providing ten's position overflow pulses when recycling from 9 to 0,

(e) numerical display means, positioned to be seen through said viewfinder for displaying a numerical value depending upon the number of complete sets of K pulses counted by said counter means,

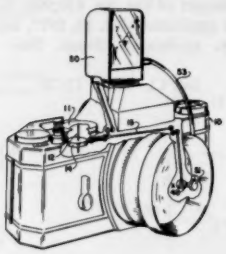
(f) at least K−1 indicators, positioned to be seen through said viewfinder, and

(g) means responsive to the number of remaining pulses counted by said binary counter for illuminating a set of said indicators to visually indicate the number of remaining pulses counted, said means for illuminating comprising a connection between the highest order bit position of said binary counter and one of said indicators for illuminating said indicator when said binary counter holds the binary value 10 therein, and an ORed connection between the lowest order bit position in said counter and another of said indicators for illuminating said another indicator when said binary counter holds either of the values 01 or 10.

4,135,796
FLASH SYNCHRONIZATION INTERLOCK

Charles Abbeloos, 5585 Verdi St., Brossard, Quebec, Canada (J4W 1B4)

Filed May 16, 1977, Ser. No. 797,079
Int. Cl.[2] G03B *15/02*
U.S. Cl. 354—126 1 Claim



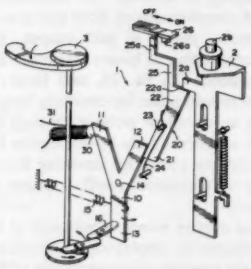
1. A mechanical interlock system mounted in a focal plane shutter camera that blocks the track flange opening of the flash attachment bracket of the camera when the shutter speed control knob of the camera is set for a shutter speed inappropriate for use with a flash unit, in which

a cam is fixed to the shaft of the shutter speed control knob of the camera, with mechanical means engaging said cam so as to block the track flange spacing and the electrical socket opening when the control knob is rotated to a speed setting inappropriate for use with a flash unit.

4,135,797
SHUTTER LOCK MEANS FOR CAMERAS

Hiroshi Ohmura, and Hideto Shirane, both of Yokohama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 16, 1977, Ser. No. 769,297
Claims priority, application Japan, Feb. 17, 1976, 51-16420
Int. Cl.[2] G03B *15/05*
U.S. Cl. 354—128 1 Claim

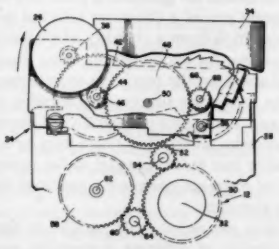


1. A shutter lock means for a photographic camera with a strobo flash light device which prevents shutter release until the charge stored in a strobo capacitor reaches a required level to flash a strobo discharge lamp comprising an electromagnetic lock releasing means including an electromagnet which is to be in two conditions, in one of said conditions the electromagnet being magnetized and in the other demagnetized, said electromagnetic lock releasing means comprising a permanent magnet and an electromagnetic coil wound therearound, said permanent magnet working when said coil is not energized and being nullified when said coil is energized; a mechanical lock means which prevents depression of a shutter release button when said electromagnetic lock releasing means is in one of said two conditions and allows the depression of the shutter release button when said electromagnetic lock releasing means is in the other condition, said mechanical lock means comprising a shutter lock member which is urged to be engaged with a shutter release member to prevent the movement thereof, and a lock release member which is urged toward a first position in which it prevents said engagement between said shutter lock member and said shutter release member, said lock release member being held in a second position by attractive force of said permanent magnet to allow the engagement between said shutter lock member and the shutter release member, said lock release member being brought in contact with said permanent magnet to be held by the attractive force thereof in response to wind-up movement of a film wind-up lever provided on the camera; and a control circuit connected with said electromagnet which selectively supplies to said electromagnet an electric power to cause the electromagnetic lock releasing means to be in one of said two conditions or cuts off supply of the electric power to said electromagnet to cause the electromagnetic lock releasing means to be in the other condition depending on a level of the charge stored in the strobo capacitor, said control circuit supplying to said coil an electric current when the charge stored in the strobo capacitor has reached the required level to flash the strobo discharge lamp.

4,135,798
CAM ACTUATED COUPLING AND LATCHING APPARATUS

Frederick Slavitter, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 23, 1977, Ser. No. 854,090
Int. Cl.[2] G03B *3/02, 13/02, 13/20*
U.S. Cl. 354—163 12 Claims



1. A photographic camera comprising:

a first support structure;

a variable focus lens mounted on said first support structure for forming an image of a subject to be photographed at a focal plane within said camera;

a second support structure connected to said first support structure for pivotal movement with respect thereto about an axis parallel to the optical axis of said lens;

a motor mounted on said second support structure;

complementary means respectively mounted on said first and second support structures for selectively displacing one of said support structures about said pivotal axis relative to the other of said support structures between a first predetermined arrangement and a second predetermined arrangement, said displacing means including an actuator mounted for displacement between a first predetermined position wherein said support structures are disposed in their said first arrangement and a second predetermined position wherein said second support structures are disposed and locked in their said second arrangement; and

means for coupling said motor to said lens so that said motor may be energized to effect the focusing of said lens, said coupling means including a first gear mounted on said first support structure and a second gear mounted on said second support structure, said first and second gears lying in substantially the same plane for rotation about axes

substantially parallel to said optical axis of said lens and arranged so as to be inoperably disposed relative to one another when said actuator is in its said first position causing said support structures to be disposed in their said first arrangement and so as to be operably engaged when said actuator is in its said second position causing said support structures to be disposed and locked in their said second arrangement.

4,135,799

PHOTOGRAPHIC CAMERA WITH FLASHLIGHT CONTACTS

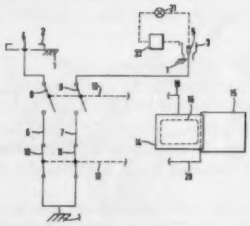
Hubertus Reimann; Werner Hahn, and Herbert Welzel, all of Dresden, German Democratic Rep., assignors to VEB Pentacon Dresden Kamera und Kinowerke, Dresden, German Democratic Rep.

Filed Dec. 3, 1976, Ser. No. 747,182

Claims priority, application German Democratic Rep., Dec. 10, 1975, 190007; Jul. 7, 1976, 193737

Int. Cl.[2] G03B *15/03*

U.S. Cl. 354—147 **5 Claims**



1. In a camera having a housing and including a shutter with an opening leaf and a closing leaf and having a contact nipple for a cable connected flash unit and a contact shoe for the direct attachment of a flash unit, the provision of a flash synchronising arrangement comprising:

a. first and second switching means electrically connectible between a center contact of the contact shoe and a center contact of the contact nipple respectively and the camera housing;

b. first coupling means connectible between said first and second switching means and the opening leaf of said shutter to close said first and second switching means on actuation of the shutter to ignite the flash unit when attached to said camera contact shoe or when connected to the contact nipple; and

c. second coupling means connectible between said first and second switching means and the closing leaf of said shutter to open said first and second switching means after actuation of the shutter and ignition of the flash unit to isolate the center contact of said contact shoe from the center contact of said contact nipple and to isolate the center contacts from said housing.

4,135,800

CASSETTE FOR STACK OF SINGLE FILMS

Herbert Weidanz, Kursiefener Str. 16a, 5074 Odenthal-Globusch, and Horst Auf Dem Graben, Auf dem Steitacker, 24, 5000 Cologne 90, both of Fed. Rep. of Germany

Filed Aug. 10, 1977, Ser. No. 823,439

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640715

Int. Cl.[2] G03B *19/10;* **B65D** *85/48*

U.S. Cl. 354—174 **12 Claims**

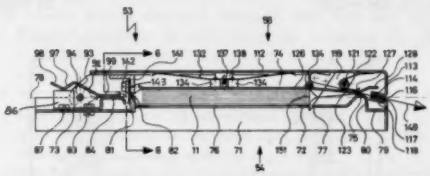
1. A cassette for the reception of a plurality of flat rectangular single films, whose emulsion sides are orientated in the same direction and which lie one upon the other in a stack so that they are approximately in coincidence, the cassette having a cavity shaped approximately like a rectangular parallelpiped for the reception of the stack in a foil tube and comprising

a bottom part through which the lowest single film can be transported,

a cover part, which fits thereon in a light-proof manner,

a light trap at one longitudinal area of the cassette which allows the flat foil tube to be pulled from the cavity,

at least one piercing and cutting knife in the cassette at a distance from the light trap, which is approximately vertical to the plane of the foil tube and having an internal straight cutting edge which projects inwards over its effective length at least the height of the stack and extends parallel to the contour plane of the stack provided there and serves as a retaining stop for the stack in the cavity, and



a cross cutter parallel to this contour plane at a distance from it that is slightly larger than the edge length of the stack, by means of which the foil tube can be cut off, so that it is open in the direction of the cross-cutter.

4,135,801

CAMERA HAVING FILM WINDING-TO-REWINDING CONTROL BY RELEASING EITHER OF TWO BUTTONS

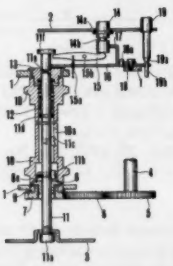
Akio Sunouchi, Tokyo; Susumu Kozuki, Yokohama, and Yoshiaki Watanabe, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,645

Claims priority, application Japan, Mar. 18, 1976, 51-29534

Int. Cl.[2] G03B *1/00*

U.S. Cl. 354—214 **4 Claims**



3. In a camera provided with a film winding-up device including a film transporting sprocket and with a film rewinding device, a changeover device for controlling film winding-up and rewinding operation comprises;

(a) clutch means arranged between said sprocket and a film winding-up drive mechanism,

(b) two actuating means for operating the clutch means, one of said actuating means being arranged on the bottom panel of the camera, and the other being arranged on another panel of the camera,

whereby said clutch means is disconnected by any one of said actuating means so that the sprocket is rendered freely rotative for film rewinding purposes.

4,135,802

CASSETTE FOR LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL

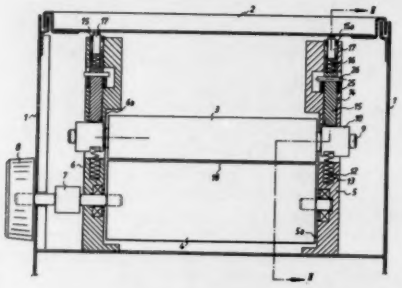
Normann Scharre, Munich, and Siegfried Bartel, Gauting, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 9, 1977, Ser. No. 850,025

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651407

Int. Cl.[2] G03B *17/26*

U.S. Cl. 354—275 10 Claims



1. A cassette for light-sensitive photographic material which is to be transferred between the cassette and a copying apparatus having at least one door which is movable between an open and a closed position, comprising a housing having an open side and a wall provided with a slot connectable to an opening of the copying apparatus; a removable cover for said open side; a pair of rollers inwardly adjacent said slot, at least one of said rollers being mounted for movement towards and away from the other roller between one position in which said rollers define a gap for passage of the photographic material, and another position in which said rollers bear upon each other and form a seal against the entry of light from said slot into said cassette; first means for effecting movement of said one roller to said other position in response to placement of said cover on said open side; and second means for effecting movement of said one roller to said one position in response to movement of said door of said copying apparatus to the closed position thereof.

4,135,803

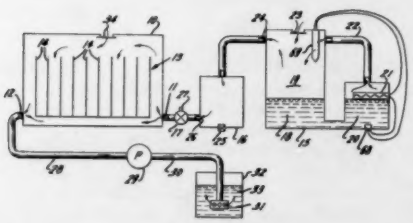
DEVELOPING APPARATUS FOR HIGH RESOLUTION PHOTO-SENSITIVE DIAZO PLATES

Hendrik Van Houwelingen, Ryswyk, Netherlands, assignor to GAF Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,432

Int. Cl.[2] G03D *7/00*

U.S. Cl. 354—299 14 Claims



1. An apparatus for developing an image on high resolution photo-sensitive plates comprising, in combination, a developing chamber having an inlet, an outlet, and means for receiving a plurality of sensitized plates to be developed disposed in the line of flow from the inlet to the outlet; means for vaporizing a supply of a developer producing liquid to generate gaseous developing medium; selectively operable valve means for alternately introducing said developing medium into the chamber via the inlet to expose the plates thereto to effectuate image development, and ambient air into said chamber to flush the gaseous developing medium therefrom after development of the plates; and a vacuum pump in communication with the outlet of said chamber to induce the continuous flow of gaseous developing medium or ambient air therethrough.

4,135,804

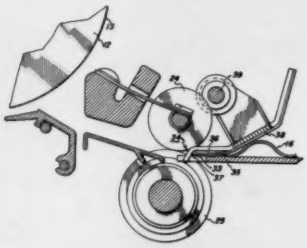
REGISTRATION SYSTEM FOR A REPRODUCING MACHINE

Wayne F. Schoppe, Webster, and Bruce A. Winship, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 9, 1977, Ser. No. 794,767

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 SH 8 Claims



1. In a reproducing apparatus comprising;

means for forming an image on a sheet;

means for propelling a sheet along a path to said image forming means;

means for registering the sheet with respect to said image forming means, said registering means comprising: a stop member for intercepting an edge of said sheet, said stop member including a stop face and a chute portion; and means for moving said stop member either into sheet blocking relationship in said path, or out of said sheet blocking relationship; and

a guide member for supporting said sheet along said path at a position adjacent said stop member; the improvement wherein, said registering means further includes:

a resilient means for urging said sheet against said guide member as it is intercepted by said stop face, said resilient member being mounted to said chute portion of said stop member with a free end thereof adjacent said stop face (means).

4,135,805

COUNTERBALANCING APPARATUS

Thomas N. Taylor, Rochester, and Charles J. Mahler, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 4, 1977, Ser. No. 821,667

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R 14 Claims

1. Apparatus for counterbalancing a movable member comprising:

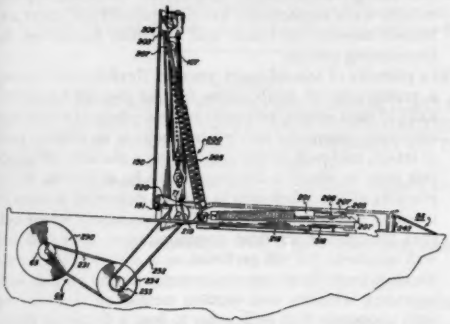
a member;

means for supporting said member for movement between a first position and a second position different from said first position;

means for counterbalancing the movement of said member

between said positions, said counterbalancing means comprising:

a gas spring connected to said member; and



a tension spring connected to said member, said tension spring being arranged to increasingly counter the force exerted by said gas spring as said member is moved from said first position to said second position.

4,135,806

POWER TRANSMISSION CONTROL MECHANISM FOR USE IN THE COPYING APPARATUS

Tadashi Abe; Tatumi Horiuchi; Ken Nakamura; Yoshio Ohyama, and Shigeatsu Kurihara, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

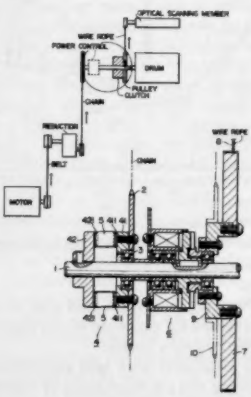
Continuation of Ser. No. 633,436, Nov. 19, 1975, abandoned.

This application May 10, 1977, Ser. No. 795,521

Claims priority, application Japan, Nov. 25, 1974, 49-135736

Int. Cl.[2] G03G *15/28, 15/32*

U.S. Cl. 355—8 **7 Claims**



1. In copying apparatus:

a photosensitive drum rotatable in a predetermined direction at a predetermined speed;

an optical scanning system reciprocably movable along a path in opposite directions, said optical scanning system being movable in one direction at a predetermined speed related to said predetermined speed of said drum and being movable in the opposite direction;

said drum and said optical scanning member having different respective specific frequencies of vibration and different respective mechanical impedances;

a single power source for driving said drum and said optical scanning system;

and means for supplying power from said single power source comprising:

a drum drive shaft connected to drive said drum;

a first sprocket rotatably mounted on said drum drive shaft;

an endless flexible drive means connected between said single power source and said first sprocket;

a first flanged member fixedly mounted on said drum drive shaft;

a second flanged member rotatably mounted on said drum drive shaft and connected to be driven by said first sprocket;

an elastic means disposed between said first and second flanged members for absorbing and reducing the vibrations and stably supplying power to said drum and said optical scanning system;

a wire-rope pulley rotatably mounted on said drum drive shaft for reciprocating movement thereon;

a wire rope connected between said wire-rope pulley and said optical scanning system;

a clutch mounted on said drum drive shaft and engageable to connect said drum drive shaft and said second wire-rope pulley to effect movement of said optical scanner system in said one direction in synchronism with rotation of said drum;

and means connected to said wire-rope pulley and actuatable when said clutch is disengaged for driving said optical scanning system in said opposite direction.

4,135,807

APPARATUS FOR THE REPEATED RECORDING OF DEFORMATION IMAGES ON A RECORDING MATERIAL

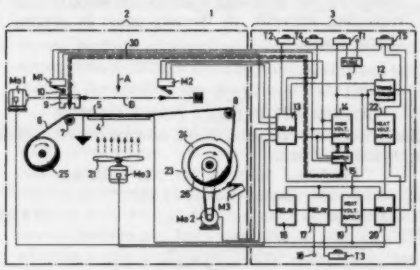
Roland Moraw, Naurod, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 15, 1976, Ser. No. 666,980

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1975, 2511633

Int. Cl.[2] G03G *16/00*

U.S. Cl. 355—9 **2 Claims**



1. An apparatus for the repeated recording and erasing of deformation images on a surface of a strip of recording material, wherein said material is composed of a photoconductive, thermoplastic recording layer supported by an electrically non-conductive support layer, said apparatus comprising:

a corona device for applying an electrostatic charge with a predetermined selected polarity to the photoconductive thermoplastic recording layer;

high voltage power supply means for charging the corona, the high voltage supply having outputs of opposite polarity;

camera means for exposing the electrostatically charged surface to an image pattern to produce a charge image;

a film rostrum having a thermally conductive layer wherein the conductive layer is heatable by electric power supplied from said power supply means;

first motor means for advancing the strip of recording mate-

rial over the film rostrum to both develop and erase the charge image, whereby development and erasure is accomplished by supplying heat energy to the photoconductive, thermoplastic recording layer via the heated conductive layer of the film rostrum;

second motor means for moving said corona device forward and backward along a path over the recording layer to apply electrostatic charges thereto to charge the layer prior to creating the charge image and to assist in erasing the charge image therefrom;

switch means for controlling the operation of said apparatus, the switch means comprising:

first switch means positioned at the beginning of the path over which the corona device moves for operation by the corona device when the corona device is returned to the beginning of the path by the second motor means;

second switch means positioned at the end of the path over which the corona device moves for operation by the corona device when the corona device is advanced to the end of the path by the second motor means;

a high voltage change-over switch for switching the polarity of voltage supplied to the corona charging device by the high voltage power supply means;

a motor power switch connecting said second motor to the power supply;

a relay circuit operating the high voltage change-over switch and motor power switch;

means connecting the relay circuit to the first and second switch means, whereby, when the corona device arrives at either the beginning of the path or the end of the path, the high voltage change-over switch reverses polarity of the voltage supplied to the corona device, and wherein, when the corona device arrives at the end of the path and operates the second switch, the motor power switch interrupts power to the motor; and

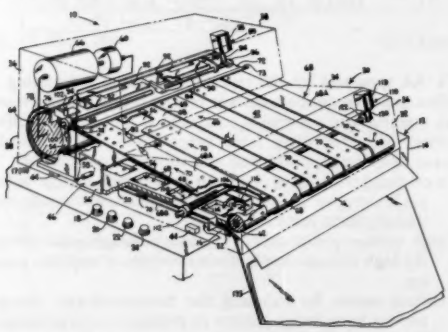
manual switch means for bridging the motor power switch and reversing the polarity of the second motor when the second switch is operated by the corona charge device and also when the corona charge device returns to the beginning of the path while applying a charge to the recording material opposite that on the recording material, to thereby assist in erasing the charge image.

4,135,808

DOCUMENT FEEDER FOR A COPIER

Douglas I. Morrison, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 745,054
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 **14 Claims**



1. In combination with a copier having a document illuminating station and including a photoreceptor and means operable for flash illuminating a document at the illuminating station to form an image on the photoreceptor which corresponds to information on the document, a document feeder comprising:

(a) vacuum means including an enclosure and means for evacuating the enclosure, the enclosure including top and bottom walls respectively having a plurality of apertures formed therein, the lower wall apertures located at the illuminating station;

(b) a plurality of spaced apart, smooth, flexible belts having a multiplicity of perforations formed therein longitudinally of their length, said belts endlessly looped about said enclosure, means for moving said belts in an endless path of travel, said path of travel including a plurality of upper belt runs to which a document may be delivered and a plurality of lower belt runs to which a delivered document is fed by said belts, the belt perforations in said upper belt runs disposed in air flow communication with said top wall apertures, the belt perforations in said lower belt runs disposed in air flow communication with the bottom wall apertures, whereby said vacuum means and said moving belts cooperate with each other to feed a delivered document to and through the illuminating station as said delivered document is held in contact with said moving belts; and

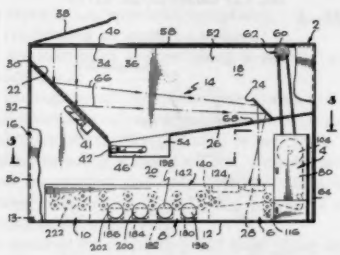
(c) means adapted to be interconnected to the copier for coordinating document movement with operation of said flash illuminating means for copying said moving document.

4,135,809

MICROFILM RECORDING AND DEVELOPING APPARATUS

Fred H. Ponce, 932 Arroyo Ter., Alhambra, Calif. 91801

Filed Jun. 24, 1977, Ser. No. 809,616
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—27 **42 Claims**



1. A microfilm developing device, comprising:

film storage means;

camera means;

means for advancing film from said film storage means to said camera means for exposure of a predetermined length of film by said camera means;

optical means associated with said camera means for optically imprinting and photographically recording an image on said predetermined length of film;

processing means for chemically treating film exposed by said camera means in response to actuation of said optical means, said processing means including a plurality of detachable containers for developing, fixing, neutralizing and washing the exposed film; Transporting and guiding means including arcuate channels in each one of said plurality of detachable containers, and including coupled sets of film engaging pinch rollers adjacent the entrance and exit of each one of said channels in said containers and cooperating with the former, said pinch rollers including film engaging means effective to engage only lateral portions of said film and said rollers being arranged to effect conveyance of exposed film in loop-and self-threading

fashion via said channels, consecutively through each one of said containers;

drive means coupled to said pinch rollers for film processing movement of the exposed film to a collection point; and

heating means for drying of the chemically treated film.

4,135,810

METHOD AND SYSTEM FOR AUTOMATICALLY MATCHING THE FORMAT OF THE PROJECTED IMAGE OF AN ORIGINAL TO THE FORMAT OF THE COPYING MATERIAL

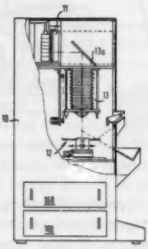
Karl Walter, Penzberg, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,970

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638696

Int. Cl.² G03B *29/00, 27/52, 27/34, 27/58*

U.S. Cl. 355—29 **10 Claims**



2. In a copying machine, in combination, means for transporting a web of copying material on-edge along a predetermined path, including web-guidance means operative for guiding the web along the transport path, the web-guidance means being provided with masking means including a stationary transverse-edge framing plate, and a shiftable transverse-wedge framing plate mounted shiftable in the direction of web transport; means for supporting an original to be copied including an original carrier mounted for longitudinal and transverse shifting movement, the original carrier being provided with means defining a first longitudinal-edge reference line, and the masking means being provided with means defining a corresponding first longitudinal-edge reference line; projecting means located intermediate the original carrier and the web and operative for projecting an image of the original onto the web; a source of infrared light mounted on the original carrier beneath the plane occupied by an original supported on the original carrier, the source of infrared light extending along substantially the entire length of the original carrier, and being operative for causing the projecting means to project towards the masking means infrared-light images of the light-dark transitions associated with the first and second transverse edges of an original supported on the original carrier; means for automatically matching the format-breadth of the image of the original projected on the web to the format-breadth of the web, including means automatically operative for bringing the projected image of the first longitudinal-edge reference line on the original carrier into register with the corresponding first longitudinal-edge reference line of the masking means, and means for automatically adjusting the projection scale of the image projected by the projecting means to cause the format-breadth of the projected image to assume a value at least nearly equal to but not in excess of the format-breadth of the web; first light-detecting means mounted on the stationary framing plane operative in response to the projected infrared-light image of the light-dark transition associated with the first transverse edge of the original for generating a first signal indicative of the relative positions of the edge of the stationary framing plate and the first transverse edge of the original; second light-detecting means mounted on the shiftable framing plate operative in response to the projected infrared-light image of the light-dark transition associated with the second transverse edge of the original for generating a second signal indicative of the relative positions of the edge of the shiftable framing plate and the second transverse edge of the original; means receiving the first signal and operative in dependence thereon for automatically shifting the original carrier until the projected infrared-light image of the light-dark transition associated with the first transverse edge of the original is in register with the edge of the stationary framing plate; means receiving the second signal and operative in dependence thereon for automatically shifting the shiftable framing plate until the projected infrared-light image of the light-dark transition associated with the second transverse edge of the original is in register with the edge of the shiftable framing plate; means operative for performing an exposure of the framed section of web using exposure light to which the web is sensitive; cutting means located downstream of the exposure location for severing exposed sections of web; marking means mounted on the shiftable framing plate and operative for providing a cutting mark on the web prior to transport of the exposed section of web out of the exposure location; and mark-detecting means mounted on the stationary framing plate and operative for sensing the cutting mark and in response thereto activating the cutting means.

4,135,811

ELECTROPHOTOGRAPHIC APPARATUS

Masaji Nishikawa, Hachioji; Eiichi Sato, Tama, and Kazuhisa Yanagisawa, Mitaka, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Mar. 1, 1978, Ser. No. 882,902

Claims priority, application Japan, Mar. 4, 1977, 52-23667

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 SC **6 Claims**

1. An electrophotographic apparatus comprising

a photosensitive screen having a number of small apertures formed therein and traveling through a printing area along an arcuate passage having a radius r_1 at a constant peripheral veocity v_1;

a record medium arranged opposite to the photosensitive screen with a distance d at the printing area and traveling through the printing area along an arcuate passage having a radium $r_2 (r_2 \neq r_1)$ at a constant peripheral velocity v_2;

means for forming on the photosensitive screen an electrostatic latent image corresponding to a document to be copied; and

means for generating a corona ion stream which passes in the printing area through the apertures of the screen to the record medium and has a charging or printing width W;

wherein a ratio k of the peripheral velocities v_1 and v_2 of said photosensitive screen and record medium satisfies the following equation:

for $r_2 > r_1$

$$\frac{r_2(2r_1+d)}{r_1(2r_2+d)} < k\left(=\frac{v_2}{v_1}\right) < \frac{r_2(2r_1+d)}{r_1(2r_2+d)} + \frac{r_2(r_2-r_1)(2r_1+d)(r_1+r_2+d)}{\sqrt[3]{4}\, r_1(2r_2+d)^3} \cdot \left(\frac{W}{2r_1}\right)^2$$

for $r_2 < r_1$

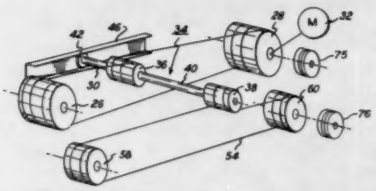
$$\frac{r_2(2r_1+d)}{r_1(2r_2+d)} > k\left(=\frac{v_2}{v_1}\right) > \frac{r_2(2r_1+d)}{r_1(2r_2+d)} - \frac{r_2(r_1-r_2)(2r_1+d)(r_1+r_2+d)}{\sqrt[3]{4}\, r_1(2r_2+d)^3} \cdot \left(\frac{W}{2r_1}\right)^2.$$

4,135,812

MAGNIFICATION CHANGE MECHANISM

David O. Kingsland, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 20, 1977, Ser. No. 807,939
Int. Cl.[2] G03B 27/48, 27/50, 27/70
U.S. Cl. 355—51 16 Claims



1. Optical projection apparatus utilizing a pulley and cable mechanism for positioning optical components thereof, said apparatus comprising:

fixed pulley means;

translatable pulley means;

a cable entrained about said fixed pulley and said translatable pulley means;

means for selectively preventing rotation of said fixed pulley means; and

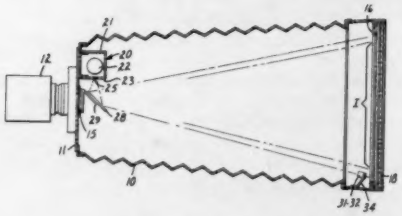
means for effecting translation of said translatable pulley means simultaneously with the prevention of rotation of said fixed pulley means whereby the spacing between said translatable pulley means and fixed pulley means can be varied.

4,135,813

CAMERA WITH FLASH EXPOSING DEVICE

John W. Frank, St. Paul, and Lawrence M. Lucking, May Township, Washington County, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed May 23, 1977, Ser. No. 799,250
Int. Cl.[2] G03B 27/76
U.S. Cl. 355—71 8 Claims



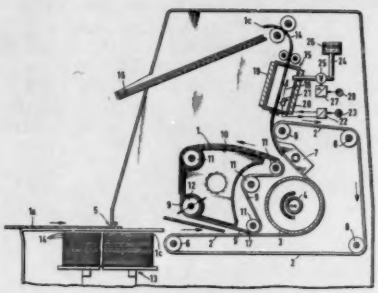
1. In a camera for exposing photosensitive material for producing half-tone images and comprising a copy board for supporting the original image, means defining a light-tight enclosure, a lens assembly for projecting an image of said original onto a film plane in said enclosure for supporting light-sensitive material; a shutter for said lens assembly, and a screen supported between said shutter and film plane; the improvement comprising light exposure means for flash exposing said photosensitive material along the optical axis of said lens assembly, said exposure means comprising a source of light disposed within said light-tight enclosure to project light between said shutter and said film plane along said optical axis, and means for energizing said light source for a predetermined time interval.

4,135,814

PROCESS AND APPARATUS FOR THE PRODUCTION OF PHOTOCOPIES USING TWO-COMPONENT DIAZOTYPE MATERIAL

Herbert Schroter, Taunusstein, and Eckehard Stein, Frankfurt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,876
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623982
Int. Cl.[2] G03C 1/58; G03B 27/30
U.S. Cl. 355—106 6 Claims



5. In a photocopying apparatus for the production of photocopies with two-component diazotype material which cannot be developed by the action of heat alone and including an exposure station and a development chamber, the latter following the former in the direction of transport of the diazotype material,

and further including a heating device and a feed pipe, opening into said development chamber, for feeding aqueous ammonia solution into said chamber,

the improvement comprising a gallium-modified and/or indium-modified mercury lamp in said exposure station,

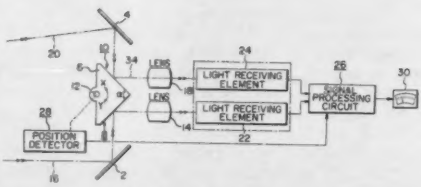
and heating means for heating the development chamber to a temperature between about 105° and 120° C., said development chamber having a sufficiently high heat capacity that a first partial amount of aqueous ammonia solution fed into the chamber in one time interval is completely vaporized, and superheated, before a second partial amount is fed into the chamber in a succeeding time interval.

4,135,815

RANGE FINDING DEVICE

Makoto Masunaga, Tokyo; Kazuya Hosoe, Machida; Tokuichi Tsunekawa; Shuichi Tamura, both of Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 865,924
Claims priority, application Japan, Jan. 6, 1977, 52-504
Int. Cl.[2] G01C 3/08, 3/00; G03B 7/08
U.S. Cl. 356—4 12 Claims



1. A range finding device comprising:

(a) a range finding optical system arranged to form first and

second images of an object with a relative positional parallax corresponding to the range from the device to the object;

(b) first and second photoelectric light receiving means arranged to receive said first and second images respectively;

(c) vibrating optical means for displacing said respective first and second images on the light receiving surfaces of said respective first and second light receiving means at the same cycle, said first and second light receiving means scanning said respective first and second images at the time of displacement of said first and second images by said vibrating optical means to provide image data concerning said first and second images;

(d) first and second data storing means for receiving and storing image data concerning said first and second images provided by said first and second light receiving means;

(e) coincidence detecting means for detecting coincidence between the data concerning image elements corresponding to said first and second images stored in said first and second storing means;

(f) means for causing the image data concerning the second image stored in said second storing means to relatively shift, at a predetermined quantity, with respect to the image data concerning the first image stored in said first storing means; and

(g) counting means for counting the relative shift quantity of the image data concerning the second image stored in said second storing means with respect to the image data converting the first image stored in said first storing means,

whereby the range of the object is found from quantities counted by said counting means when said coincidence detecting means detects the optimum coincidence between the data in a predetermined quantity concerning the corresponding image elements of said first and second images between the image data stored in said first and second storing means.

4,135,816

METHOD AND APPARATUS FOR DETERMINING THE TOTAL PROTEIN CONTENT OR INDIVIDUAL AMINO ACIDS

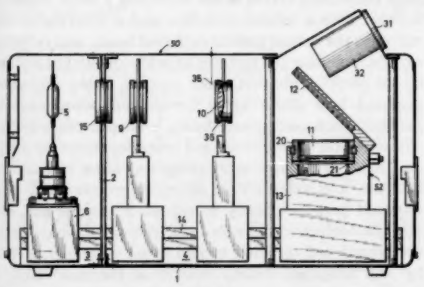
Ernst-Georg Niemann, Garbsen; Dirk Christoffers, and Bernd Georgi, both of Hanover, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Strahlen- und Umweltforschung mbH, Neuherberg, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,688

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1976, 2603069

Int. Cl.² G01J *3/30;* **G01N** *21/38*

U.S. Cl. 356—317 **17 Claims**



1. Method for determining the total protein content or individual amino acids in flour cereal flour and/or leguminous products or other substances by means of fluorescence analysis, the proteins and/or the individual amino acids being treated to attain a fluorescent effect or being self-fluorescent, comprising forming a suspension of the proteins and/or the individual amino acids, the proteins and/or the individual amino acids in the suspension being self-fluorescent or being in treated form in which they attain a fluorescent effect, then subjecting the suspension to vertical transillumination to emit fluorescence by passing a beam of primary radiation in vertical direction through the suspension to homogeneously illuminate the suspension, and then measuring the emitted fluorescence by a detector which is in vertical alignment with the suspension.

4,135,817

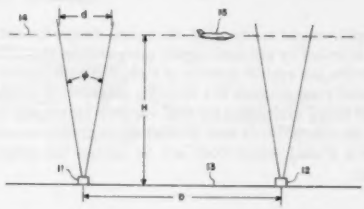
APPARATUS FOR MEASURING AN AIRCRAFT'S SPEED AND HEIGHT

William R. Young, Newport News, and Charles W. Stump, Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1978, Ser. No. 885,065

Int. Cl.² G01P *3/36;* **H04N** *7/18*

U.S. Cl. 356—28 **9 Claims**



1. Apparatus for producing values that can be used to calculate the speed and height of an aircraft comprising:

a first TV camera with its field of view covering a first part of the anticipated path of said aircraft;

a second TV camera with its field of view covering a second part of the anticipated path of said aircraft;

the second TV camera being at the same elevation as the first TV camera, a known distance therefrom, and forming a line with the first TV camera that is a projection of said anticipated path;

means connected to said first TV camera for measuring the time t_1 it takes an aircraft to travel through the field of view of the camera; and

means connected to said first and second TV cameras for measuring the time t_2 it takes an aircraft to travel between the fields of view of said first and second TV cameras whereby whenever an aircraft travels along said anticipated path the values t_1 and t_2 are produced which can be used to calculate the speed and height of said aircraft.

4,135,818

PLATELET AGGREGATION MONITORING DEVICE

Frederick M. Kent, Warrington, and Michael Sokol, Abington, both of Pa., assignors to Bio/Data Corporation, Willow Grove, Pa.

Continuation-in-part of Ser. No. 542,997, Jan. 22, 1975, Pat. No. 3,989,382. This application Jul. 9, 1976, Ser. No. 703,993

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.² G01N *33/16, 21/24;* **G01D** *9/08*

U.S. Cl. 356—39 **4 Claims**

1. In a platelet aggregation monitoring device comprising:

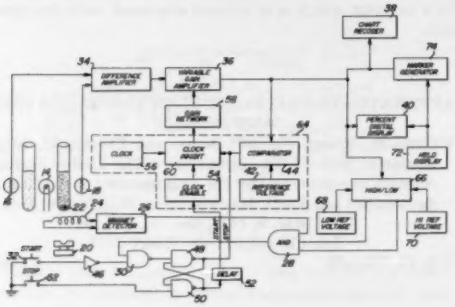
electro-optical means for continuously generating a signal representing the difference in the optical densities of a platelet rich plasma sample and a platelet poor plasma sample;

electronic means for multiplying said signal by a variable factor;

electronic means for automatically adjusting said factor such

that said multiplied signal is equal to a pre-selected standard value, whereby the sensitivity of the device is automatically adjusted;

electronic means for maintaining said factor constant once it has been adjusted to the point that said multiplied signal is equal to said preselected standard value;



the improvement comprising electronic means for determining whether or not said signal, representing the difference between the optical density of a platelet rich plasma and a platelet poor plasma, lies within a preselected range prior to its being multiplied by said variable factor and inhibiting the operation of said platelet aggregration monitoring device if said signal does not lie within the preselected range.

4,135,819

APPARATUS FOR MEASURING THE AGGREGATION RATE OF PARTICLES

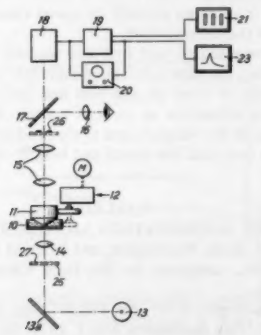
Holger Schmid-Schönbein, Aachen-Laurensberg, Germany, assignor to Ernst Leitz GmbH, Marl, Germany

Continuation of Ser. No. 559,259, Mar. 17, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,707

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413285

Int. Cl.[2] G01N *33/16*

U.S. Cl. 356—39 **10 Claims**



1. Apparatus for rapidly ascertaining the information disclosing blood subsidence from a minimum amount of native blood by measuring the natural aggregation rate of particles in liquid blood, comprising:

(a) means for illuminating and defining an optical axis;

(b) upper (**11**) and lower (**10**) means defining a transparent anti-aggregation chamber therebetween for being filled with a minimum amount of blood specimen, said blood specimen touching said upper and lower means and located along said optical axis;

(c) drive means for agitating said anti-aggregation chamber by way of slow motion of said upper means relative to said lower means and for separating said blood specimen;

(d) rapid shut-off means to stop said agitated chamber;

(e) photoelectric receiver means responsive to illumination leaving said anti-aggregation chamber;

(f) means for deriving electrical signals from said photoelectric receiver means after stopping said chamber over the whole aggregation time; and

(g) an analyzing stage for providing the first derivative of said electrical signals as a function of time, said derivative being indicative of the blood subsidence of said blood specimen.

4,135,820

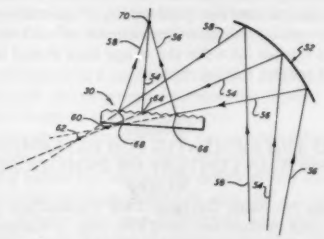
BEAM COMBINING APPARATUS

Udo W. Drews, Glen Ellyn, and Norman Shifrin, West Chicago, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 611,691, Sep. 9, 1975, abandoned. This application Oct. 28, 1977, Ser. No. 846,509

Int. Cl.[2] G01J *3/02*

U.S. Cl. 356—320 **5 Claims**



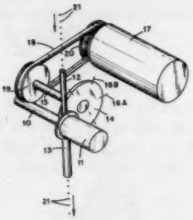
1. In a spectrophotometer of the type wherein sample and reference beams of diverging radiant energy are directed from separate substantially equivalent optical paths to a photoelectric detector, whose response varies with the position and/or angle of incidence of a radiation beam incident on the sensitive receiving surface of said detector, the combination comprising:

a beam combining arrangement including a beam combiner member with a reflective surface and a spherical folding mirror in the optical path of each said beam, said reflective surface including the surfaces of sidewalls within a plurality of parallel grooves, said grooves being adjacently disposed in a planar array across said beam combiner member, each said groove being V-shaped cross-sectionally with said sidewalls thereof being separated by a dihedral angle, said planar array presenting lineal intersections between said sidewalls of adjacent grooves and being disposed perpendicularly across an alignment axis with said photoelectric detector, said divergent beams being converged and directed to said beam combiner member by said spherical folding mirrors at the same angle of incidence relative to said alignment axis, said dihedral angle being less than twice said angle of incidence while being greater than 90° and no greater than 120°, said sidewalls reflecting said beams to a common focal point along said alignment axis in correcting image aberration caused by the off-axis operation of said spherical folding mirrors.

4,135,821
CALIBRATION OF OPTICAL PARTICLE-SIZE ANALYZER

William H. Pechin, Oak Ridge; Louis H. Thacker, Knoxville, and Lloyd J. Turner, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 22, 1977, Ser. No. 780,159
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—335 **4 Claims**

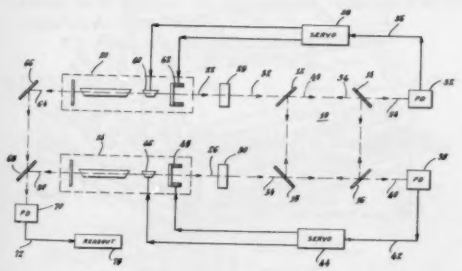


1. In an optical particle size analyzer of the type including a source of a collimated light beam, a light detector for receiving said light beam and providing an electrical output proportional to incident light, means for sequentially feeding spherical particles through the path of said light beam whereby a portion of the light beam falling upon said detector is intercepted by each passing particle in proportion to its size, and a read-out circuit coupled to the electrical output of said detector for providing a measure of particle size as well as a count of the number of respective particles measured, the improvement comprising:
   a calibration rotary disc provided with a plurality of respective radially extending opaque wires of different diameters, each wire corresponding to a particular equivalent spherical particle diameter; and
   means for rotating said disc such that each of said wires is passed at a desired frequency between said light beam and said detector, whereby said detector output may be adjusted to provide the desired signal for comparison with corresponding spherical particles when they are subsequently being analyzed by said analyzer.

4,135,822
LASER GYROSCOPE

Shaoul Ezekiel, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 650,325, Jan. 19, 1976, abandoned. This application May 6, 1976, Ser. No. 683,982
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—350 **20 Claims**

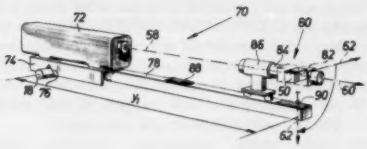


1. A sensor for measuring inertial rotation which comprises:
   a. means for reflecting monochromatic electromagnetic radiation in a closed path comprising a passive ring,
   b. generating means for forming two beams of monochromatic electromagnetic radiation, said generating means being positioned to cause said beams to enter said closed path and to pass in resonance around said closed path in opposite directions,
   c. monitoring means for monitoring the resonant frequency shift of each of said beams within the closed path caused by inertial rotation of said closed path, and
   d. means responsive to said monitoring means adapted to control said generating means to change the frequency shift of at least one beam of monochromatic electromagnetic radiation to equal the resonant frequency of at least one of the beams within the closed path.

4,135,823
OPTICAL ASSEMBLY FOR GENERATING LIGHT BEAMS ACCURATELY AT RIGHT-ANGLES TO EACH OTHER

Torgny W. Hörvallius, Gavle, Sweden, assignor to Aktiebolaget SAMEFA, Stockholm, Sweden

Filed Jul. 20, 1976, Ser. No. 707,473
Claims priority, application Sweden, Jul. 25, 1975, 7508469
Int. Cl.[2] G01C *1/00*
U.S. Cl. 356—148 **7 Claims**



1. An optical assembly comprising a light source for emitting a collected concentrated light beam and an optical apparatus including (a) a beam splitter in the form of a quadrangular prism composed of two semi-quadrangular prisms having a semi-reflecting transparent region at their common interface, and (b) mirror means located spaced away from and facing one external face of the quadrangular prism;
   said light source being oriented to direct said light beam toward said optical apparatus to be incident upon the quadrangular prism and to be split thereby into two part beams, one of which after reflection at said mirror means is an emergent light beam angularly deviated relative to said path of the incident beam;
   the mirror meand having a position so adjusted relative to the quadrangular prism that said angular deviation is equal to 90° and is constant for a range of angles of incidence of said incident beam upon the quadrangular prism;
   a base, said light source and optical assembly being mounted on said base, said optical apparatus being accommodated in a housing, said housing being a part of a deviating unit, said deviating unit being rotatably mounted in a body on said base of the optical assembly, the axis of rotation of the deviating unit substantially coinciding with said incident light beam from the light source.

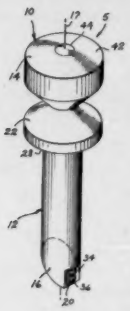
4,135,824
SCOPE FOR VIEWING THE INTERNAL SURFACE OF A BORE OR SIMILAR CAVITY

Ira D. Jones, 53170 Oakton Dr., South Bend, Ind. 46635

Filed Apr. 25, 1977, Ser. No. 790,392
Int. Cl.[2] G01B *11/22*
U.S. Cl. 356—241 **15 Claims**

1. In a scope for viewing the internal surface of a bore or similar cavity formed in a work member having an external wall defining said cavity, said scope including a rod having a viewing end and an image transmitting end, said image transmitting end including means for directing image producing light transmitted from an external source through said rod along the axis thereof onto said internal surface toward said viewing end, said rod including a shoulder spaced from said

image transmitting end, the improvement wherein said image transmitting end includes an optical surface paralleling said rod axis through which said internal surface image is viewed, a pair of circular gauging indicators on said optical surface, each indicator lying in a plane paralleling the axis of said rod, one



indicator being spacedly located from the other along a direction paralleling the axis of said rod, said space between indicators being selectively determined whereby said cavity internal surface image is viewable between said indicators through said viewing end when the rod is inserted into said cavity with the shoulder thereof abutting said wall member of the cavity.

4,135,825

INSTALLATION FOR EXTRUDING PLASTICS

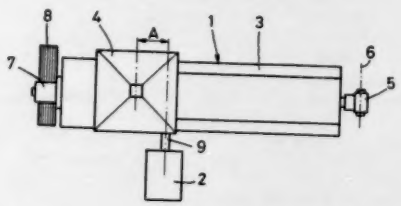
Eberhard Kertscher, Romanel, Switzerland, assignor to Maillefer S.A., Ecublens, Switzerland

Filed Oct. 4, 1976, Ser. No. 729,016

Claims priority, application Switzerland, Oct. 10, 1975, 13180/75

Int. Cl.[2] A21C *1/06*

U.S. Cl. 366—79 **7 Claims**



1. An installation for extruding plastic material comprising a screw extruder having a cylinder provided with a hopper near the rearward end of said cylinder for introducing said plastic material into said cylinder, and with an extrusion head secured to the forward end of said cylinder, for receiving said plastic material in a fluid state, and at least one pump having a delivery pipe connected to at least one port disposed in the wall of said cylinder for delivering an additional fluid product to said extruder through said port or ports during the extrusion operation, said cylinder comprising a first zone wherein the inner surface thereof being provided with grooves and a second zone located downstream with respect to said first zone and wherein the inner surface of the cylinder is smooth, and port or ports opening out into one or more of said grooves at a location of said first zone in the vicinity of the downstream end thereof, said plastic material being at said location at a temperature higher than the temperature at said readward end and in an incompletely fluid state, the inside diameter of the cylinder in said second zone being less than the maximum diameter measured from the bottom of said grooves, and said screw extruder being of essentially uniform dimensions within said second zone and in the portion of said screw extruder immediately upsteam thereof.

4,135,826

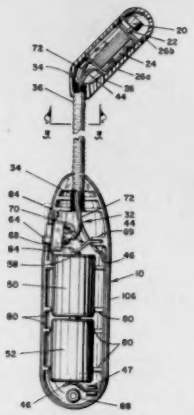
VIBRATORS

Harold K. Holm, 410 W. Harvey, Santa Ana, Calif. 92707

Filed Apr. 11, 1977, Ser. No. 786,336

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—116 **14 Claims**



1. In a vibrator:

(a) a mass;

(b) motive means for importing vibratory motion to the mass;

(c) a holder; and

(d) interconnecting means for supporting said mass at a distance from said holder while insulating the holder in part from vibratory motion of said mass comprising a resilient arm in the form of a cantilever the cantilever comprising a coiled extension spring.

4,135,827

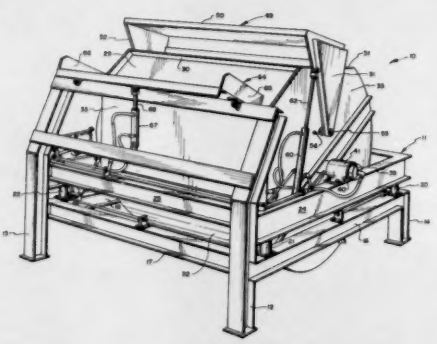
ROTARY BLENDER

John M. Thomas, 219 Felton, Caldwell, Id. 83605

Filed Apr. 11, 1977, Ser. No. 786,110

Int. Cl.[2] B01F *9/02*

U.S. Cl. 366—141 **7 Claims**



1. A rotary blender for particulate material rotatable about a horizontal axis comprising:

(a) a framework;

(b) a blender mounted on said framework having two end-

pieces, an opening extending from one endpiece to the other, sidewalls extending at substantially right angles from each other from the opening and terminating in a circular sidewall wherein the endpieces and sidewalls are joined together into an integral unit;

(c) lifting vanes attached to the blender circular sidewalls in an overlapping, offset V position such that the material to be blended will be lifted by one vane and flow by gravity down the blender wall onto the next vane as the blender is rotated;

(d) a gate adapted to fit over said blender opening in a sealing relationship and removable therefrom, and

(e) drive means to rotate said blender.

4,135,828

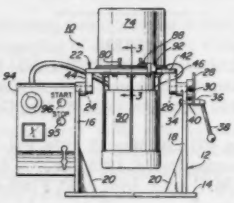
MIXING APPARATUS

James E. Cubak, 3 N 909 Wildrose Rd., St. Charles, Ill. 60174

Filed Nov. 25, 1977, Ser. No. 854,791

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—197 **6 Claims**



1. Mixing apparatus, comprising

a support frame,

a support member,

a motor carried by said support member on one side thereof,

a mixing element extending from the other side of said support member and drivingly connected to said motor,

a mixing vessel having an open top and a closed bottom,

means for sealably securing said open top of said vessel to said other side of said support member over said mixing element,

trunnion means extending from said support member and journaled in said frame for enabling said support member to be at least partially inverted after said vessel has been secured thereto, and

locking means for locking said support member to said frame with said vessel in an inverted position.

4,135,829

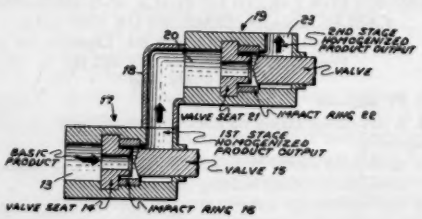
HOMOGENIZER

Richard J. Grillo, and Carmine T. Castellano, both of White Plains, N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 24, 1977, Ser. No. 827,199

Int. Cl.[2] B01F *15/00*

U.S. Cl. 366—337 **6 Claims**



1. A homogenizer having an increased homogenization effectiveness comprising:

a first cell rupture valve assembly including

a first valve seat having an input to receive a product to be homogenized and an output,

a first valve disposed adjacent said output of said first valve seat cooperating with said first valve seat to partially homogenize said product, and

a first impact ring encircling said output of said first valve seat to homogenize said partially homogenized product; and

a second cell rupture valve assembly including

a second valve seat having an input coupled to said first impact ring to receive said homogenized product from said first valve assembly and an output,

a second valve disposed adjacent said output of said second valve seat cooperating with said second valve seat to partially homogenize said received homogenized product,

a second impact ring encircling said output of said second valve seat to complete homogenization of said product, and

an output for said second valve assembly disposed adjacent said second impact ring to remove said homogenized product from said second valve assembly.

4,135,830

WIRE PRINTER PRINTING HEAD

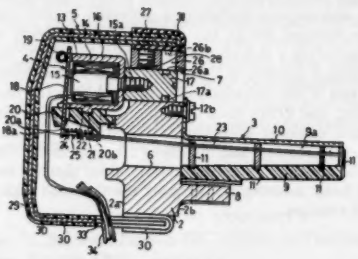
Yukio Hishida; Yuichi Asai; Toshikatsu Kondo; Akira Asai, all of Nagoya; Atsuo Sakaida, Gifu, and Chiaki Miyazawa, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 31, 1977, Ser. No. 802,000

Claims priority, application Japan, Jun. 14, 1976, 51/77288[U]; Jun. 14, 1976, 51/77289[U]

Int. Cl.[2] B41J *3/12*

U.S. Cl. 400—124 **4 Claims**



1. In a wire print device for printing on a record medium, a print head comprising:

(a) a disk member which acts as a support, said disk member having a plurality of radially arranged cylindrical bores parallel to an axis of said disk member;

(b) a plurality of wire print assembly members supported by said disk member, each of said wire print assembly members having an electromagnet with a flap-armature and a yoke, an auxiliary frame member fixed to the yoke, a printing wire with a top portion movably supported by said auxiliary member along the longitudinal direction thereof, and a spring mounted between said wire and said auxiliary frame member for enabling said printing wire top portion to establish contact with said flap-armature;

(c) a plurality of rod members respectively secured to each of said wire print assembly members, each of said rod members being provided with an annular groove on a periphery thereof, said rod member being inserted into each of said cylindrical bores so that said wire print assembly members are radially arranged on said disk member;

(d) a plurality of eccentric pins each with a lower projection supported on said disk member so that said lower projection of each eccentric pin is engaged with the annular groove of said rod member for adjusting the supporting

position of each of said rod members in said cylindrical bore; and,

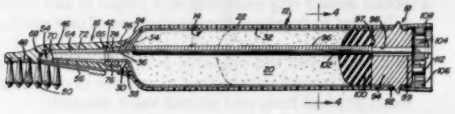
(e) a plurality of lock screws supported on said disk member for respectively locking each of said rod members at the adjusted position in each of said cylindrical bores.

4,135,831

LAMINATED FOUNTAIN TOOTHBRUSH WITH BARRIER

Jack Reitknecht, 210 E. Broadway H-503, New York, N.Y. 10002

Filed Jan. 14, 1977, Ser. No. 759,268
Int. Cl.[2] A46B *11/02*
U.S. Cl. 401—175 **13 Claims**



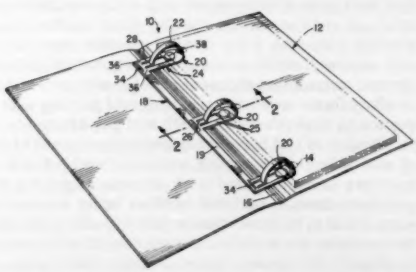
1. A fountain toothbrush comprising a housing of elongated cylindrical configuration, a cylindrical insert means in said housing for receiving toothpaste and forming a barrier to migration of moisture and air in relation to the toothpaste therein, a brush head connected to one end of said housing and insert means, said brush head including a plurality of bristles thereon, a passageway extending from the bristles to the insert means for guiding toothpaste onto the bristles, and insert means in said way forming a barrier to migration of moisture an air in relation to the toothpaste in the passageway, and closure means for the passageway where it communicates with the bristles to form a sealed container for the toothpaste, said insert means being captively retained in the housing and passageway, said housing including a generally cylindrical neck having an internal flange therein, said insert means in said housing including a threaded neck formed by plastic material encapsulating a portion of the insert means and a shoulder at the inner end of the threaded neck engaged with the flange on the housing, said brush head including an internally threaded end portion engaged with the threaded neck of the insert means in the housing and in captive engagement with the opposite side of the flange from the shoulder thereby securing the brush head, housing and housing insert means together in assembled relation.

4,135,832

BINDER AND APPARATUS FOR RETAINING LEAVES THEREIN

Ira M. Saltz, Greenlawn, N.Y., assignor to Lubliner/Saltz, Inc., New York, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,554
Int. Cl.[2] B42F *13/06, 13/08*
U.S. Cl. 402—15 **26 Claims**



1. In a binder for leaves having perforations adjacent an edge thereof, said binder including a pair of covers hingedly joined at a spine thereof to permit closing the binder by bringing its covers together and opening the binder by separating its covers, at least one leaf holder for retaining said leaves in said binder, comprising:

an actuating member having a first end mounted to one of said covers for pivotal movement about a cover axis parallel to said spine and spaced therefrom, the second end of said actuating member being mounted to the other of said covers for sliding movement thereon so that said second end slides towards and away from said spine when said binder is opened and closed, respectively; and

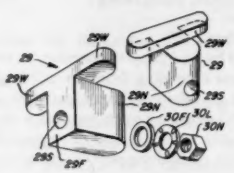
a flexing member extending through a corresponding perforation on each leaf, said flexing member having a first end secured to be in contact with said binder at a fixed point intermediate said cover axis and the position of the actuating member second end when said binder is fully opened, the second end of said flexing member being secured near the actuating member second end so as to slide therewith, whereby said flexing member is bowed away from said covers when said binder is opened and is flattened towards said covers when said binder is closed.

4,135,833

RAILWAY BOLSTER LUG

Robert W. MacDonnell, Crete, and Otto A. Shander, Chicago Heights, both of Ill., assignors to R. W. Mac Company, Crete, Ill.

Division of Ser. No. 472,428, May 22, 1974, Pat. No. 3,924,542. This application Dec. 4, 1975, Ser. No. 673,695
Int. Cl.[2] B61F *1/12, 5/04, 5/50;* **F16B** *43/02*
U.S. Cl. 403—43 **3 Claims**



1. A lug for compression engagement with an inboard bolster edge region bordering a window opening in an inclined intermediate bottom wall portion of a bolster, said lug comprising an elongated main body with at least one passage having an axis extending therethrough, an outboard surface perpendicular to the axis of said passage at one end thereof for receiving compression forces and transmitting the same in distributed relation therethrough, and an inboard face contour providing a convexly contoured surface portion above the other end of said passage perpendicular to said axis to distribute said compression forces.

4,135,834

DEVICE FOR TAKING UP SLACK AND SECURING CABLES, CHAIN MEMBERS OR THE LIKE

Daniel A. Bartman, R.D. #1, Austraw Rd., Ligonier, Pa. 15658

Filed Nov. 16, 1977, Ser. No. 852,107
Int. Cl.[2] F16B *7/06*
U.S. Cl. 403—44 **3 Claims**

1. A device for taking up slack in a chain, cable or the like comprising:

a. turnbuckle means having means at either end thereof for connection to load holding means;

b. said turnbuckle means having means for tightening and loosening disposed thereon and attached thereto;

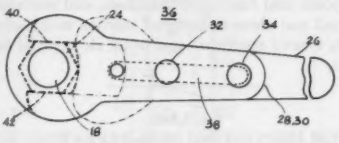
c. means for adjusting said tightening and loosening means adapted to be intermittently engagable therewith, said adjusting means comprising a wrench handle with a slot

therein held between two plates having holes therein for passing said turnbuckle means therethrough;

d. said means for adjusting said tightening and loosening means being disposed thereabout and extending substantially radially from an axis passing longitudilly through said turnbuckle means;

e. means for facilitating the engaging and disengaging of said tightening and loosening means from said adjusting means;

f. means for holding said means for adjusting in a predetermined relationship with respect to said tightening and loosening means, said holding means in combination with



said facilitating means adapted to permit the engaging and the disengaging of said adjusting means with said tightening and loosening means such as to permit radial movement of said adjusting means from said longitudinal axis such that said adjusting means can assume a position being in disengagement with said tightening and loosening means having a maximum predetermined distance from said tightening and loosening means; and

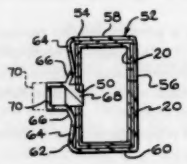
g. means for permitting the locking of adjusting means into a position in engagement with said tightening and loosening means such that said adjusting means is not disengagable from said tightening and loosening means.

4,135,835

LATCH UNIT FOR ADJUSTABLE BED FRAME RAILS

John P. Kitchen; Terry L. Gabhart, both of Georgetown, and Joseph S. Lanham, Lexington, all of Ky., assignors to Hoover Universal, Inc., Saline, Mich.

Division of Ser. No. 681,133, Apr. 28, 1976, Pat. No. 4,070,717.
This application Aug. 3, 1977, Ser. No. 821,575
Int. Cl.[2] F16B *7/14*; A47C *19/04*
U.S. Cl. 403—108 **3 Claims**



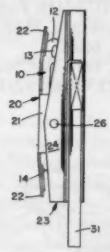
1. A latch unit for a pair of rectangular telescoped rails having a pair of adjacent side walls with aligned openings therein, said unit comprising a hollow rectangular body of one-piece, non-rigid construction telescoped over said telescoped rails, a locking projection integrally formed with said body on one side thereof and shaped to fit in said pair of said aligned openings in said rails so as to latch said rails in predetermined relative positions, said one side of said body being of a deformable shape enabling movement of said projection in a direction axially of said aligned openings between a position extending into said openings and a position withdrawn from said openings, and handle means on said one side of said body positioned in substantial alignment with said locking projection so as to be manually operable to withdraw said locking projection from said aligned openings.

4,135,836

CHAIR BACK WITH POLYMER SPRING

Thomas E. Rensland, and Alexander A. Karrip, both of Grand Rapids, Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Filed Nov. 30, 1977, Ser. No. 855,967
Int. Cl.[2] F16C *11/00*; F16D *1/12*
U.S. Cl. 403—120 **12 Claims**



1. In a chair with two members movable relative to each other about pivot axis means, spring means for controlling movement of one of said members with respect to another of said members, said spring means including:

a resilient polymer member having a body with a pair of enlarged ends, and pivot receiving means intermediate said ends for receiving said pivot axis means, each of said enlarged ends having an opening extending therethrough; and

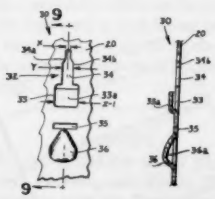
said spring means being positioned between said two movable members with said pivot axis means located in said pivot receiving means so that upon application of an external force causing relative rotation between said two members, said resilient polymer member deforms allowing said openings to close and permitting a range of pivotal movement between said two members about said pivot axis means, and in the absence of an external force said two members being positioned at a neutral position relative to one another by the force applied by said resilient polymer member to said two members.

4,135,837

SHELVING ASSEMBLY

James M. Suttles, Elberton, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 19, 1978, Ser. No. 870,847
Int. Cl.[2] B25G *3/00*
U.S. Cl. 403—245 **10 Claims**



1. Disjointable connecting means for securing together a pair of structural elements each having planar surfaces, said connecting means comprising a locking plate secured to one of said elements and disposed in fixed spaced generally parallel relation to the planar surface thereof, and a locking aperture formed in the other of said elements and extending through the planar surface thereof, said locking aperture having an entry portion configured to receive said locking plate and also hav-

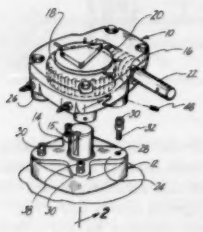
ing a locking portion in communication with said entry portion, said locking portion being configured to prevent passage therethrough of said locking plate in a direction normal to said planar surfaces when said locking plate is moved into registry with said locking portion of said locking aperture, said locking plate being secured to said one element by a pair of oppositely disposed supporting tabs.

4,135,838

VALVE ACTUATOR FASTENER

Ervin K. Vandenberg, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed Jul. 13, 1977, Ser. No. 815,179
Int. Cl.[2] F16K *31/53*
U.S. Cl. 403—316 **6 Claims**



1. In combination with a valve and a valve actuator, said valve actuator having a housing and said valve having a mounting flange, means for securing said valve actuator housing to said mounting flange comprising:

at least one straight member secured to said mounting flange and having a protruding portion which includes a coaxial reduced diameter portion, adapted to be received in a recess in said valve actuator housing; and

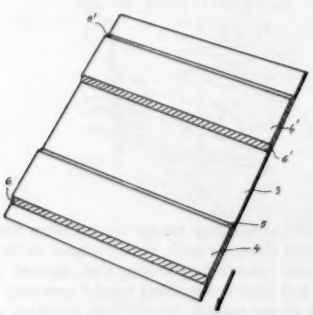
means for securing said member protruding portion within said recess in said valve actuator housing, said last-mentioned means comprising a portion of said housing including a bore that intersects said recess, and means disposed in said bore for abuttingly engaging said protruding portion.

4,135,839

DEVICE TO PREVENT VEHICLES FROM PASSING A TEMPORARILY SPEED-REDUCED PART OF A ROAD WITH HIGH SPEED

Bertil Engwall, Ankdammsgatan 11, Solna, Sweden (S-171 43)

Filed Aug. 17, 1977, Ser. No. 825,382
Claims priority, application Sweden, Aug. 18, 1976, 7609210
Int. Cl.[2] E01F *9/04*
U.S. Cl. 404—16 **4 Claims**



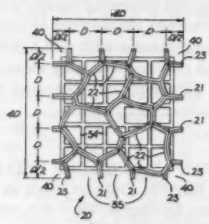
1. Apparatus for laying on a road surface to induce a vehicle driver to reduce speed comprising a first elongated mat element for creating a relatively low bumping frequency in a vehicle when passing over said first element and a second elongated mat element for creating a relatively high bumping frequency in the vehicle when passing over said second element, said first element including a road contact surface and a series of substantially trapezium section substantially parallel transverse beam elements on an upper surface of said first element opposite said road contact surface, each trapezium section beam element having a top surface substantially parallel to said road contact surface of said first element and having side surfaces inclined outwardly from said top surface, said second element also including a road contact surface and a series of substantially rectangular section substantially parallel transverse beam elements on an upper surface of said second element opposite said road contact surface, said beam elements of said second mat element being of smaller width and being more closely spaced apart than said beam elements of said first mat element.

4,135,840

TOOLS FOR IMPRINTING NON-REPEATING STONE PATTERNS IN FRESH CONCRETE

John L. Puccini, 432 Upper Lake Rd., Thousand Oaks, Calif. 91360, and Edward F. Shea, Jr., 2855 E. Wastach Ct., Westlake Village, Calif. 91361

Filed Feb. 27, 1978, Ser. No. 881,699
Int. Cl.[2] E01C *23/16*
U.S. Cl. 404—93 **7 Claims**



1. A platform tool for forming non-repeating stone patterns in fresh concrete, said platform tool comprising a plurality of blades, disposed in a single plane in a non-repeating predetermined outline of said stone patterns, said blades;

(a) completely defining the perimeter of all interior stone patterns;

(b) defining only a portion of the perimeter of all exterior stone patterns, the terminating ends of each of said blades forming said exterior stone patterns being spaced an equal distance from each other and one-half of said equal distance from each corner;

whereby said non-repeating design is formed by imprinting a first pattern with said platform tool, creating defined interior patterns and partial defined exterior patterns, said tool is then rotated into any other position, such that any of said terminating end is aligned with any of said imprinted partially defined exterior patterns and imprinted thereby, completely defining said aligned exterior pattern, said complete non-repeating design can be formed in any fresh concrete slab by such repetitive steps of aligning and imprinting.

4,135,841

MUD FLOW HEAVE COMPENSATOR

Bruce J. Watkins, Rancho Palos Verdes, Calif., assignor to Regan Offshore International, Inc., Torrance, Calif.

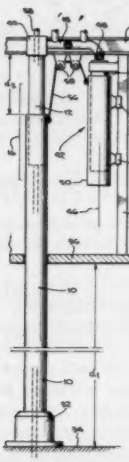
Filed Feb. 6, 1978, Ser. No. 875,640
Int. Cl.[2] E02B *17/00*
U.S. Cl. 405—196 **6 Claims**

1. In a fluid conduit employing a telescoping junction be-

tween a first conduit section and a second conduit section, the improvmement for compensating the fluid flow therein for surges and ebbs produced by longitudinal relative movement between the sections of the conduit through the telescoping junction comprising:

(a) a closed telescoping container having a first part and a second part, said first part being operably connected to move longitudinally along its axis of telescoping in direct combination with longitudinal movement of the first conduit section;

(b) a conduit connected to communicate with the fluid con-



duit on one end and with said container on the other end; and,

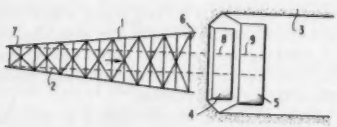
(c) means connected to said second part and responsive to relative changes in longitudinal position between the first conduit section and the second conduit section for moving said second part along its axis of telescoping in the same direction as said first part is moving relative to the second conduit section at a greater rate whereby the internal volume of said container is made to change in the opposite direction an amount equal to any change in internal volume of the fluid conduit as a result of longitudinal movement between the first and second sections thereof.

4,135,842

METHOD FOR TRANSPORTING AND ERECTING OFFSHORE TOWERS

Graham J. Blight, and Hien T. Djie, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Jan. 13, 1978, Ser. No. 869,315
Int. Cl.[2] E02D *25/00*
U.S. Cl. 405—209 **10 Claims**



1. A method for transporting an offshore tower to an offshore site and erecting said tower to a generally upright position on a submerged surface, said method comprising the steps of:

supporting one end of said tower on first barge means;

supporting the other end of said tower on second barge means;

towing said barge means and tower to an offshore site;

launching said tower from said barge means by mutually separating said first and second barge means by applying substantially horizontal and oppositely directed forces to said first barge and tower,

slidably displacing said one tower end and said first barge means in response to said separating, whereby said one tower end slides across said first barge means into the water, while maintaining said other tower end supported on said second barge means,

separating said first barge means from supporting engagement with said one tower end;

causing the other end of said tower to be displaced across said second barge means to the side thereof, and

separating said other tower end from said second barge means;

maintaining said first barge means and second barge means substantially upright during said launching; and

causing said tower, while separated from supporting engagement with at least said first barge means, to settle to an upright position on a submerged surface;

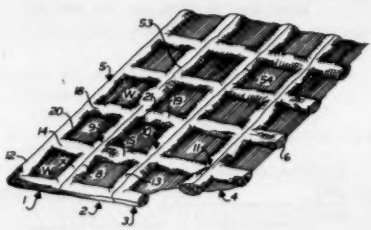
said separating of said first barge means from supporting engagement with said one tower end being operable to heel said first barge means and displace said first barge means from said second barge means and said one tower end.

4,135,843

EROSION CONTROL MAT

Tomoji Umemoto, Nagoya, and Yukichi Nakamura, Tokyo, both of Japan, assignors to Construction Techniques, Inc., Cleveland, Ohio

Filed Jul. 21, 1977, Ser. No. 817,785
Claims priority, application Japan, Jul. 27, 1976, 51-89506
Int. Cl.[2] E02B *3/12*
U.S. Cl. 405—18 **9 Claims**



1. An erosion control mat of textile material comprising an integrated arrangement of frame units, each unit, forming in cooperation with adjacent frame units a tubular perimeter, hardened cementitious material filling said tubular perimeter, each unit having a generally open center area defined by said tubular perimeter, said center area being provided with filter means effective to prevent the egress of erodible matter while being sufficiently open in structure to permit the cultivation of seeds and seedlings.

4,135,844

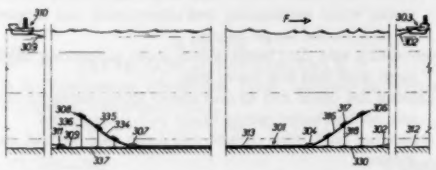
LAYING OF UNDERWATER PIPELINES

Jacques E. Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpments Operationnels des Richesses Sous-Marines "C.G. DORIS", Paris, France

Continuation-in-part of Ser. No. 757,098, Jan. 5, 1977, Pat. No. 4,096,705. This application Jul. 8, 1977, Ser. No. 813,977
Claims priority, application France, Feb. 18, 1977, 77 04782
Int. Cl.[2] F16L *1/04*
U.S. Cl. 405—171 **18 Claims**

1. A method of laying a pipeline assembly on the bed of a body of water to interconnect first and second underwater installations, comprising the steps of: towing a pipeline assembly section to bring the same from the first to the second under-

water installation, while making front and rear end portions of the pipeline assembly section buoyant to maintain said end portions in the midst of water and while giving a length of the pipeline assembly intermediate said end portions a negative buoyancy to maintain the same on the sea bed to trail thereon,



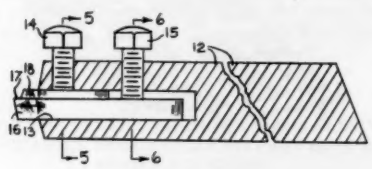
thereby to prevent said intermediate length of the pipeline assembly from deviating; engaging the rear and fore ends of the pipeline assembly section into said first and second underwater installations respectively; and thereafter ballasting said fore and rear end portions of the pipeline assembly to rest on the bed.

4,135,845

CUTTING TOOL

Andrew Rea, 10271 Nottingham, Detroit, Mich. 48224

Filed Apr. 26, 1978, Ser. No. 900,253
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—3 **2 Claims**



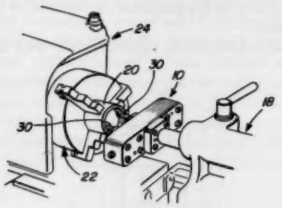
1. An improved carbide bit cutting tool of the type that uses a tool bit having a steel body and a carbide tip cemented on the front end thereof, comprising a tool body having a tool-bit-receiving aperture formed therein inwardly of the front end thereof, a carbide tool bit slidable in said aperture so as to be adjustably positionable outwardly of the front end of said tool body, said tool bit having a steel body and a carbide tip cemented on the front end thereof, fastener means directly engaging said tool bit for adjustably fastening said tool bit in place in said aperture, a chip breaker member disposed on top of said tool bit and slidable in said aperture so as to be adjustably positionable inwardly of the front end of said tool bit, second fastener means directly engaging said chip breaker for adjustably fastening said chip breaker member in place in said aperture on top of said tool bit, the front end of said tool bit having a predetermined shape for carrying out a cutting operation and the front end of said chip breaker member having a corresponding shape so as to break chips during said cutting operation inwardly of the front end of said tool bit, the cross-section of said tool bit and that of said chip breaker member both filling up that of said aperture to enhance the solidity with which they are held in place in said tool body.

4,135,846

INSIDE-OUTSIDE DEBURRING TOOL AND OPTIONAL FLYCUTTER

James J. Nowakowski, 2908 Shady La., Racine, Wis. 53402

Filed Jun. 20, 1977, Ser. No. 808,381
Int. Cl.[2] B23B *51/04, 43/02*
U.S. Cl. 408—183 **9 Claims**



1. An inside-outside deburring tool and flycutter, comprising, in combination:

(a) a body provided with an internal cavity;

(b) a shank mounted on the body for attaching the body to a machine tool;

(c) a pair of cutting tool holders movably disposed in the cavity provided in the body; and

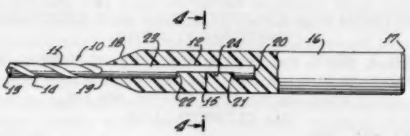
(d) support means associated with the body for adjustably mounting the tool holder on the body, the support means including a pair of rods each supporting a respective one of the tool holders for individual adjustment within the cavity provided in the body, and a single shaft supporting both of the tool holders for displacement dependent on one another, the pairs of rods being arrangeable with the body, shank and tool holders in a first arrangement of the elements to form an inside-outside deburring tool, and the shaft being arrangeable with the body, shank, and tool holders in a second arrangement of the elements to form a flycutter.

4,135,847

COMPOSITE DRILL FOR DRILLING CIRCUIT BOARDS

David T. Hemmings, Orange, Calif., assignor to Tulon, Inc., Gardena, Calif.

Filed Aug. 29, 1977, Ser. No. 828,504
Int. Cl.[2] B23B *51/02*
U.S. Cl. 408—226 **12 Claims**



1. A drill for a precision drilling collet which comprises:

(a) a rigid cylindrical insert having an attaching end portion and a working end portion, said working end portion having a cutting tip and drilling flutes intermediate the tip and the attaching end portion,

(b) a cylindrical plastic shank molded in rigid attachment around said attaching end portion of said insert and shaped for compatible insertion in said collet,

(c) means for eliminating axial and rotational slippage of said insert, relative to said plastic shank, when the drill is in use

(d) said means for eliminating axial and rotation slippage comprising a segment of said attaching end portion shaped to render said attaching end portion substantially noncircular in cross section,

said segment being fully encompassed by said plastic shank,

(e) said segment including a key flat on the attaching end portion of said insert, said key flat comprising;

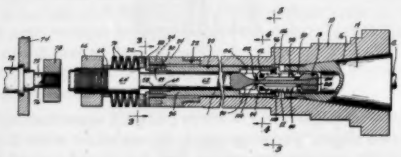
a planar base positioned substantially parallel to the axis of said insert, and transverse surfaces positioned substantially transverse to the ends of said planar base, said transverse surfaces connecting said planar base to the outer surface of said attaching end portion of said insert.

4,135,848

TOOLHOLDER CLAMP FOR MACHINE TOOLS

John J. Hughes, Greendale; Theodore F. Lis, Hartland; John W. Turner, Pewaukee, and Joseph P. Bliss, Greendale, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed May 23, 1977, Ser. No. 799,304
Int. Cl.[2] B23B *31/10*; B23C *1/00*
U.S. Cl. 408—239 A **10 Claims**



1. A toolholder clamp for clamping a toolholder in a toolholder socket on one end of a machine tool spindle, said toolholder having a threaded opening on its inner end, comprising:

a central axial bore in said spindle, said bore opening into said toolholder socket;

a drawbar slidably mounted within said bore;

at least two gripper jaws pivotally attached to said spindle within said bore at the end thereof adjacent to said toolholder socket, said gripper jaws having outer ends which project into said toolholder socket in position to engage said threaded opening of said toolholder, and the radially outer surfaces of said outer ends being serrated to engage said threaded opening;

a first pair of cam surfaces on said drawbar and a first pair of cam follower surfaces on said gripper jaws, each of said cam follower surfaces being in contact with a corresponding one of said cam surfaces, and said cam surfaces and cam follower surfaces being shaped to cam the outer ends of said gripper jaws radially outwardly when said drawbar is moved axially away from said toolholder socket;

said gripper jaws being positioned diametrically opposite each other and the outer end of said drawbar extending between said gripper jaws;

said first pair of cam surfaces comprising diametrically opposed outwardly flaring surfaces on the outer end of said drawbar adjacent to the outermost ends of said gripper jaws;

said first pair of cam follower surfaces being formed on the outermost ends of said gripper jaws;

means biasing said drawbar axially away from said toolholder socket to cause said gripper jaws to clamp a toolholder therein and to press said toolholder against the margins of said toolholder socket;

means for moving said drawbar axially toward said toolholder socket against the force of said biasing means; and

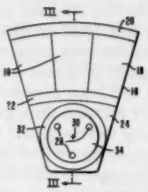
means for moving the outer ends of said gripper jaws radially inwardly when said drawbar is moved axially toward said toolholder socket to disengage said gripper jaws from said toolholder and release it for removal from said spindle.

4,135,849

PINNED ROOT TURBINE BLADE PROVIDING MAXIMUM FRICTION DAMPING

Ronald Pigott, Aston, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 21, 1977, Ser. No. 761,046
Int. Cl.[2] F01D *5/14*
U.S. Cl. 415—119 **5 Claims**



1. An axial flow turbine comprising:

a rotatable rotor;

at least one axial row of rotatable blades, each of said blades having a root portion and a tip portion radially directed from and circumferentially disposed about said rotor with at least one axial row of said rotatable blades being separatable into arcuate, circumferential sections;

means for securing each of said arcuate blade section's root portions to said rotor so that each of said sections is tangentially oscillatable about a known rotation point; and

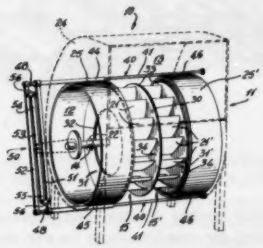
axially protruding contact locations disposed on the axially low pressure side of said blade root portions, said contact locations being radially separated from the known rotation point and being axially engageable with the rotor.

4,135,850

VENTILATOR SYSTEM WITH ADJUSTABLE DAMPER FAN

Marcel d'Anjou, Ste. Adele, Canada, assignor to Mark Hot Inc., Quebec, Canada

Filed Sep. 7, 1976, Ser. No. 721,317
Claims priority, application United Kingdom, Sep. 16, 1975, 3800/75
Int. Cl.[2] F03D *7/00*; F04D *29/46*; F01B *25/10*; F01D *17/00*
U.S. Cl. 415—148 **5 Claims**



1. A fan assembly comprising a scroll fan housing having an inlet end and an outlet end and opposed side walls, two blower wheels are secured side-by-side for rotation in said fan housing to direct air from said inlet end to said outlet end, each of said blower wheels having a plurality of inclined peripheral fan blades, said blower wheels having a common center ring disc and opposed end ring discs and a common drive shaft extending transversely and centrally of said wheels to impart a rotational drive to said wheels, two cylinder walls each being closely spaced to a peripheral margin of the ring discs of each said two blower wheels and movably supported to vary the quantity of fluid directed to said outlet end of said fan housing,

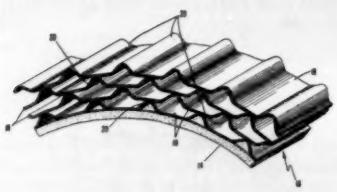
said housing further having an end wall having said outlet end in an upper section thereof, and at least an arcuate wall extending from the top of said outlet end to an area below said outlet end close to the periphery of said two blower wheels, said inlet end being located in one of said opposed side walls about the axis of rotation of said two-blower wheels, said opposed spaced end ring discs each having an inner peripheral margin, an outer peripheral margin and an inner face, said plurality of fan blades being secured transversely between said inner face of opposed spaced end ring discs and said center ring disc, said fan blades being in spaced apart inclined relationship and defining fan blade spaces between adjacent blades, said wheels when rotated in a given direction causing a suction of fluid from an area within said inner peripheral margin of said discs and directing it under pressure through said spaces externally of said outer peripheral margin of said discs, said two cylinder walls varying the exposure of the space between said fan blades, support guide means to movably support said cylinder walls, said cylinder walls having a width sufficient to cover said spaces between said fan blades at said peripheral margin, link means coacting with said support guide means to cause said movement of said cylinder wall, extension means secured to each said two cylinder walls, said link means comprising a first and second connector arm secured to said extension means of a respective one of said cylinder walls, a pivoted link secured at opposed ends to a respective one of said first and second connectors, said pivoted link when displaced on its pivot axis causing movement of said cylinder walls toward or away from each other to vary the effective total area of said fan blades of said two blower wheels.

4,135,851

COMPOSITE SEAL FOR TURBOMACHINERY

Robert C. Bill, Rocky River, and Lawrence P. Ludwig, Fairview Park, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,290
Int. Cl.[2] F01D *11/08*
U.S. Cl. 415—174 **5 Claims**



1. In a turbine having a rotor with a plurality of blades thereon mounted for rotation about an axis and a shroud of abradable material surrounding said blades in close relationship to the tips thereof to reduce aerodynamic losses, the improvement comprising

a plurality of corrugated sheets surrounding said shroud with the corrugations extending longitudinally substantially parallel to said axis of rotation of said rotor to form a compliant backing for said shroud, the innermost sheet being bonded to said shroud and the remaining sheets being bonded to each other along the lines of contact of the respective corrugations with the corrugations of one sheet being offset with respect to those of the next adjacent sheet, and

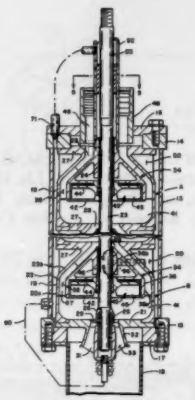
a rigid mounting fixture surrounding said compliant backing and being secured to the outermost corrugated sheet.

4,135,852

CENTRIFUGAL SLURRY PUMP AND METHOD

William R. Archibald, San Rafael, Calif., assignor to McNally Mountain States Steel Company, Provo, Utah

Filed Mar. 28, 1977, Ser. No. 782,226
Int. Cl.[2] F04D *7/00*
U.S. Cl. 415—199.3 **10 Claims**



1. A centrifugal liquid or slurry pumping apparatus having at least two aligned pumping stages, the apparatus when disposed in upright position comprising first lower and second upper stationary annular bowl-shaped housings disposed symmetrically along a predetermined axis of the pump, a drive shaft coincident with said axis, bearing means for journalling the shaft, the housing of each stage having a bottom wall through which the shaft extends, each of said bottom walls having an annular inlet opening surrounding the shaft, each housing having annular side walls, the lower portion of the side walls extending upwardly from the peripheral margin of the corresponding bottom wall and the upper portion of the side walls being upwardly convergent from the lower portion to the bottom wall of the next upper housing, the upper end of each housing forming a discharge passage for delivering slurry through the inlet opening of the next upper housing, each housing being formed to provide an unobstructed vortex chamber surrounded by the lower portion of the side walls, structural means disposed above the vortex chamber of each housing forming an annular cavity of a diameter substantially less than that of the vortex chamber and having its open side faced downwardly toward the vortex chamber, an impeller disposed in each such cavity and fixed to the driving shaft, said structural means together with the side walls of the housing forming an annular flow path extending upwardly from the periphery of the vortex chamber to the upper end of the housing, and flow directing means for directing flow of slurry in said path in a direction upwardly from the periphery of the corresponding vortex chamber and then upwardly and inwardly to discharge slurry from the upper end of the flow paths in a direction generally parallel to the axis of the shaft.

4,135,853

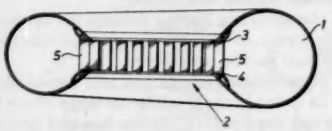
STAY RING FOR THE SPIRAL CASING OF A ROTARY HYDRAULIC MACHINE

Eric O. Jansson; Bengt O. Nauclér, and Thomas Åsberg, all of Kristinehamn, Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Kristinehamn, Sweden

Filed Mar. 28, 1977, Ser. No. 782,168
Claims priority, application Sweden, Mar. 30, 1976, 76037894
Int. Cl.[2] F01D *25/24*
U.S. Cl. 415—204 **5 Claims**

1. In a rotary hydraulic machine having a spiral casing of the type that is built up of metal plates, a stay ring comprising two

ring members disposed coaxially about the machine axis and spaced from each other axially of the machine, and axially extending stay vanes connected between said ring members, each of the ring members being a cast member of substantially triangular cross section and being disposed with one wall thereof facing the other ring member and the stay vanes therebetween, the axial ends of the stay vanes being welded to said one wall of the ring members, the ends of the metal plates of the spiral casing being welded to the ring members along annular edges of the ring members located opposite to said one



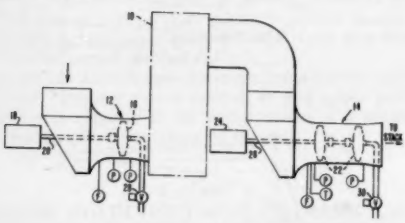
wall of the ring members substantially at the intersection between the other two walls of the ring member, said annular edge of each ring member having a diameter intermediate the diameters of the two remaining annular edges of the ring member at the two remaining vertexes of the substantially triangular cross section, and the shape of said triangular cross section of each ring member being such that extensions in radial-axial planes of the axes of the ends of the spiral casing plates pass in close proximity to the centers of gravity of the cross sections of the ring members in said planes.

4,135,854

CONTROL SYSTEM FOR VARIABLE PITCH AXIAL FAN FOR UTILITY BOILER

Morton H. Binstock, Pittsburgh, Pa., and Bertram H. Stern, Poughkeepsie, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 16, 1976, Ser. No. 751,404
Int. Cl.[2] F04D *27/00*
U.S. Cl. 416—37 **5 Claims**



1. A control system for an axial flow fan having variable pitch blades in an air flow system connected to the combustion chamber of a utility boiler, comprising:

means for varying the pitch of said blades;

means for detecting the pressure rise across said fan and generating a signal in accordance with said pressure rise;

means for detecting the air flow rate in said system and generating a signal in accordance therewith;

means for integrating said pressure rise signal and said air flow rate signal to produce an output signal corresponding to the existing flow rate and pressure rise;

means for feeding blade pitch increase and decrease signals to said blade pitch varying means in normal operation to vary the air flow rate, irrespective of changes in static pressure rise, in accordance with boiler load changes;

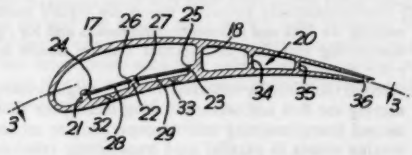
means for giving an alarm in response to said output signals from said integrating means indicating pressure rises exceeding given levels for corresponding flow rates to warn of conditions within a given degree of stall conditions, and for blocking said increase signal and substituting a decrease signal in response to said output signals indicating a predetermined closer approach to a stall condition to reduce the pitch of said blades to a position in which the pressure rise and flow rate are reduced to a safe level with respect to a stall condition.

4,135,855

HOLLOW COOLED BLADE OR VANE FOR A GAS TURBINE ENGINE

Peter G. Peill, Hamilton, Canada, assignor to Rolls-Royce Limited, London, England

Filed Oct. 2, 1974, Ser. No. 511,520
Claims priority, application United Kingdom, Oct. 13, 1973, 47917/73
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—90 R **8 Claims**



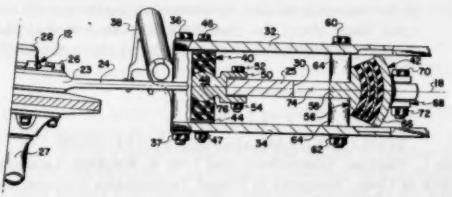
1. A hollow cooled blade or vane for a gas turbine engine comprising a skin having an interior surface on which are formed a pair of ribs, each rib having a groove therein, an apertured plate having edges engaged in the grooves of said ribs and extending between the ribs and spaced from the interior surface of the blade and sealed to the interior surface at the ribs, and cooling fluid supply means adapted to cause cooling fluid to flow through the apertures to impingement cool the interior surface.

4,135,856

ROTOR BLADE RETENTION SYSTEM

Dennis P. McGuire, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 3, 1977, Ser. No. 765,151
Int. Cl.[2] B64C *27/38*
U.S. Cl. 416—134 A **11 Claims**



1. A rotor blade retention system for connecting at least one elongated rotor blade to a rotor hub that is rotatable about a central axis, the connected rotor blade normally extending generally radially from the hub and being rotatable with the hub about its central axis, said retention system comprising:

(a) first bearing means disposed between the rotor blade and the rotor hub, the first bearing means having an axis of greatest stiffness along a longitudinal axis of the rotor blade and having axes of lesser stiffnesses transverse to the longitudinal axis of the rotor blade, the first bearing means defining a first effective elastic center on the longitudinal axis of the rotor blade and restraining the rotor blade against centrifugal forces imposed on the blade during rotation of the blade with the rotor hub;

(b) second bearing means disposed beteen the rotor blade and the rotor hub and connected with the first bearing means in parallel load transmitting relationship at least with respect to said centrifugal forces imposed on the rotor blade, the second bearing means having axes of

greatest stiffness transverse to the longitudinal axis of the rotor blade and an axis of lesser stiffness coincident with the axis of greatest stiffness of the first bearing means and the longitudinal axis of the rotor blade, the second bearing means defining a second effective elastic center which is located on the longitudinal axis of the rotor blade and which at all times is spaced from the first effective elastic center of the first bearing means;

(c) hinge means for permitting and deflecting in response to flapping motions of the rotor blade about a flapping axis which is oriented transverse to the longitudinal axis of the rotor blade and more nearly perpendicular than parallel to the central axis of the rotor hub, the hinge means being disposed between the rotor hub and the first and second bearing means and being connected to the rotor hub and to the first and second bearing means;

(d) first substantially inflexible means for rigidly interconnecting the first and second bearing means and for rigidly connecting said first and second bearing means to the rotor blade; and

(e) second substantially inflexible means for rigidly interconnecting the first and second bearing means, the first and second interconnecting means cooperating to mount the bearing means in parallel load transmitting relationship, the second interconnecting means also connecting said first and second bearing means to the hinge means in serial load transmitting relationship so that the hinge means acts in series with the first bearing means to restrain the rotor blade against centrifugal forces imposed on the blade,

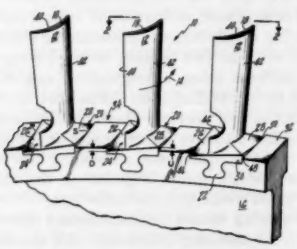
the stiffness of the hinge means in response to flapping motions of the rotor blade about said flapping axis being in comparison to corresponding stiffnesses of the first and second bearing means such that the hinge means accommodates a majority of the flapping motion of the rotor blade, the relative stiffnesses of the first and second bearing means in directions transverse to the longitudinal axis of the rotor blade being such that a lead-lag axis which is oriented transverse to the longitudinal axis of the rotor blade and more nearly parallel than perpendicular to the central axis of the rotor hub and about which oscillatory lead-lag motions of the rotor blade occur is located closer to the second elastic center than to the first elastic center within an area longitudinally bounded by and including the first and second elastic centers, the blade retention system being constructed so as to cause the natural frequency of oscillation of the rotor blade about the lead-lag axis to be less than the normal operating speed of rotation of the rotor blade and hub.

4,135,857

REDUCED DRAG AIRFOIL PLATFORMS

John L. Pannone, Glastonbury, and Fritz K. Smakula, Lebanon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 9, 1977, Ser. No. 805,219
Int. Cl.[2] F01D *5/30*
U.S. Cl. 416—193 A **17 Claims**



1. In a rotary machine of the type having an axially extending working medium flow path bounded by a plurality of circumferentially adjacent wall segments, wherein one or more of the wall segments has an airfoil section extending radially therefrom for directing the flowing medium and wherein each of the airfoil bearing segments has a platform surface with an upstream suction side corner, a downstream suction side corner, a downstream pressure side corner and an upstream pressure side corner, the improvement wherein each of said platform surfaces is formed of

a first planar surface passing through the upstream suction side corner, the downstream pressure side corner and the downstream suction side corner,

a second planar surface passing through the upstream pressure side corner, the downstream pressure side corner and the upstream suction side corner,

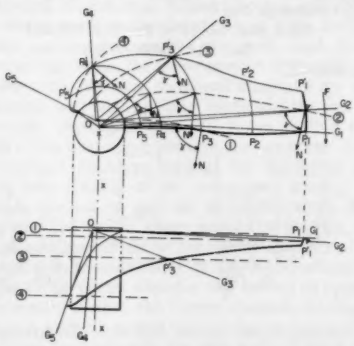
said first planar surface intersecting said second planar surface at an included angle within the range of one hundred seventy-one degrees (171°) to one hundred seventy-eight and five tenths degrees (178.5°).

4,135,858

METHOD OF PRODUCING PROPELLER BLADES AND IMPROVED PROPELLER BLADES OBTAINED BY MEANS OF THIS METHOD

Marcel Entat, 7 Bis, Boulevard Anatole, 92100 Boulogne-Billancourt, France

Filed May 28, 1976, Ser. No. 690,931
Claims priority, application France, Jun. 18, 1975, 75 19028
Int. Cl.[2] B63H *1/26*
U.S. Cl. 416—223 R **5 Claims**

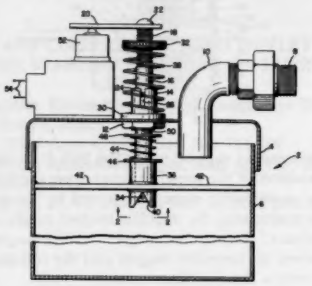


1. A propeller blade adapted to rotate about an axis of rotation and to extend outwardly therefrom, said blade having a leading edge and a trailing edge with respect to the direction of rotation of said blade about said axis of rotation, said blade having a configuration such that for any fixed point on said leading edge γ has a value less than 90°, and for any fixed point on said trailing edge γ has a maximum value of Arc cotg[(tg β)^3], wherein γ is the angle between a radius extending from said axis of rotation to said fixed point and a vector from said fixed point in the direction of rotation of said blade, said vector lying in a plane which is perpendicular to said axis of rotation and which passes through said fixed point, said vector being normal to a section outline formed by said plane passing through said blade, and wherein β is the angle between said plane and the chord of a cylindrical profile or cross-section of said blade formed by an imaginary cylinder concentric to said axis of rotation and passing through said fixed point, said planes intersecting the working face of said blade to form curves which are at least partially convex or concave in the direction of rotation of said blade.

4,135,859
POLLUTION CONTROL DEVICE ADAPTED FOR ATTACHMENT TO RESERVOIR GLAND STUFFING BOXES

Forrest L. Carson, and Joe F. Rives, both of Borger, Tex., assignors to J. M. Huber Corporation, Borger, Tex.

Continuation of Ser. No. 600,752, Jul. 30, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,242
Int. Cl.[2] F04B *49/10*
U.S. Cl. 417—9 **8 Claims**



1. An anti-pollution adapter for attachment to an oil reservoir lubricating gland of a stuffing box for an oil well polished rod of an oil well pump comprising

container means for retaining oil overflow from an oil reservoir lubricating gland of a stuffing box and having an upper portion for fixed attachment to the oil reservoir lubricating gland and a lower portion movable relative to said upper portion in response to the quantity of oil contained therein,

conduit means for fixedly connecting said upper portion of said container means with the oil reservoir and delivering overflow oil from the oil reservoir lubricating gland of a stuffing box to said container means,

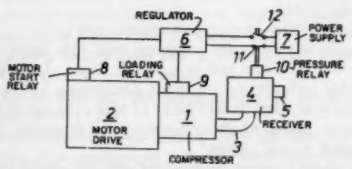
spring biased coupling means secured to one of said portions of said container means and operatively connected to the other one of said portions of said container means for suspending said lower portion thereof from said fixedly connected upper portion, and

switch means actuable upon movement of said lower portion of said container means relative to said upper portion thereof in response to the accumulation of a predetermined quantity of overflow oil therein.

4,135,860
METHOD AND DEVICE FOR CONTROLLING THE PRESSURE OF A WORKING MEDIUM DELIVERED BY A COMPRESSOR

Ludovicus J. van Nederkassel, Buggenhout, Belgium, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jun. 7, 1976, Ser. No. 693,297
Claims priority, application Sweden, Jun. 23, 1975, 7507141
Int. Cl.[2] F04B *49/02, 49/08*
U.S. Cl. 417—12 **4 Claims**



1. In the method of controlling the operation of a motor driven compressor system, in which the compressor is automatically unloaded when the receiver pressure reaches a predetermined maximum level and loaded when the receiver pressure reaches a minimum level by electric circuit means including sensor means and motor actuating means which are timed to start and stop the motor and unload and load the compressor in accordance with a predetermined mode of operation, the improvement in said method providing maximized start-stop frequency with minimized risk of overheating of the motor and savings in wear and energy consumption, comprising:

(a) stopping the motor immediately upon the receiver pressure reaching the maximum pressure level and unloading the compressor;

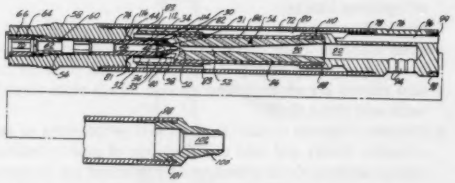
(b) restarting the motor in response to a restart pulse signal; and

(c) activating time delay means in response to said restart pulse signal for measuring a time interval upon each first stoppage of the motor upon the receiver pressure reaching the maximum level, said time delay means being effective to prevent the motor upon having been restarted from further stoppage during the time interval measured by said time delay means each time subsequent to said first stoppages that the maximum receiver pressure level is reached during said measured time interval.

4,135,861
JET PUMP WITH CERAMIC VENTURI

Francis B. Brown, La Crescenta; John W. Erickson, Huntington Beach, and Harold L. Petrie, Pasadena, all of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed May 9, 1977, Ser. No. 794,963
Int. Cl.[2] F04F *5/44*
U.S. Cl. 417—183 **9 Claims**



1. An improved jet pump comprising:

(a) a nozzle for increasing the velocity head of a high total head power fluid stream and discharging such fluid with the increased velocity head;

(b) means for mounting the nozzle in the jet pump;

(c) passage means to the nozzle to supply the power fluid thereto;

(d) a Venturi assembly, having a longitudinal axis, the Venturi assembly including a Venturi body of ceramic material having a throat aligned with the nozzle to receive the discharge therefrom, and a diffuser opening into the throat and having a progressively greater diameter as the axial distance from the throat increases, the outside of the Venturi assembly being cylindrical and of substantially constant diameter, whereby the wall thickness of the Venturi assembly decreases in the diffuser as the axial distance from the throat increases;

(e) a shell of the Venturi assembly compressively loading the ceramic Venturi body and substantially completely encasing the body throughout its length;

(f) means for mounting the Venturi assembly in the jet pump;

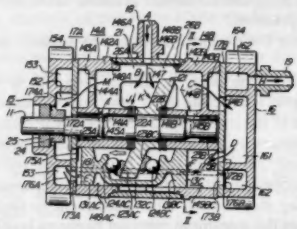
(g) passage means for supplying a fluid to be pumped to the discharge of the nozzle upstream from the Venturi throat, such fluid to be pumped passage means including a portion radially outside the Venturi assembly such that pressure of the fluid in such fluid to be pumped passage means acts radially inward on the Venturi assembly; and

(h) the Venturi assembly being disposed such that fluid pressure acting radially outward and creating tensile hoop stress is greater than any fluid pressure acting radially inward and creating compressive hoop stress.

4,135,862
SWASH PLATE TYPE COMPRESSOR

Takashi Degawa, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 7, 1976, Ser. No. 748,395
Claims priority, application Japan, Dec. 15, 1975, 50-148361
Int. Cl.[2] F04B 1/12
U.S. Cl. 417—269 8 Claims



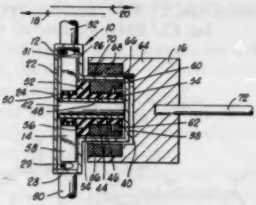
1. A swash plate compressor comprising:
a pair of cylinder blocks each of which has a cylindrical casing portion, a plurality of projections spaced from each other and axially extending from one end of said cylindrical casing portion, and at least a cylinder bore formed therein, said pair of cylinder blocks being axially arranged so that said projections of one of said cylinder blocks contact with the projections of the other cylinder block and said cylinder bores are in alignment with each other;
a drive shaft mounted rotatably on and coaxially of said pair of cylinder blocks;
a swash plate secured to said drive shaft;
pistons fitted in each of said cylinder bores, said pistons being operatively engaged with said swash plate so that said pistons are reciprocated by said swash plate rotating with said drive shaft;
a cylinder disposed to surround all said projections of said cylinder blocks and said end portions of said cylindrical casing portions from which said projections are extended axially, both ends of said cylinder terminating at said end portions of said cylindrical casing portions whereby a major extent of peripheral surfaces of said cylinder blocks are exposed;
gaskets disposed on said end portions of said cylindrical casing portions for sealing airtightly between said end portions of said cylindrical casing portions and said cylinder; and
enclosure means disposed at both ends of said cylinder blocks for enclosing the said ends, said enclosure means including passages for refrigerant communicating with said cylinder bores.

4,135,863
IMPELLER FOR A MAGNETICALLY COUPLED PUMP

Lee W. Davis; James S. Hollingsworth, both of Oklahoma City, and Leo L. Roberts, Moore, all of Okla., assignors to Little Giant Corporation, Oklahoma City, Okla.

Filed Sep. 30, 1977, Ser. No. 838,317
Int. Cl.[2] F04B 35/04; F16D 27/01
U.S. Cl. 417—420 10 Claims

1. An improved impeller for a magnetically coupled pump of the type wherein the impeller is rotatably supported on a shaft disposed within a pump housing and wherein rotation is imparted to the impeller by a rotating drive magnet disposed externally to the pump housing and magnetically coupled to the impeller, the improved impeller comprising:
a hub mounted on the shaft for rotation thereabout;
a vane assembly mounted on a forward portion of the hub, the vane assembly having a plurality of vanes extending radially with respect to the shaft for pumping fluid through the pump housing in response to the rotation of the hub;
an impeller magnet slidably mounted on a rear portion of the hub for coupling with the drive magnet;
forward stop means supported by the hub for limiting the forward disposition of the impeller magnet on the hub;

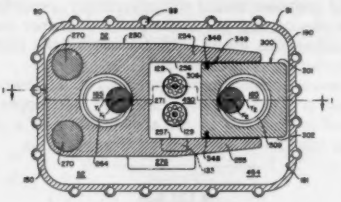


rear stop means supported by the hub for limiting the rear disposition of the impeller magnet on the hub; and
angular positioning means supported by the hub for circularly positioning the impeller magnet on the hub whereby rotation of the impeller magnet via the magnetic coupling between the impeller magnet and the rotating drive magnet rotates the impeller.

4,135,864
ROTARY COMPRESSOR AND PROCESS OF COMPRESSING COMPRESSIBLE FLUIDS

Marek J. Lassota, 8657 W. Foster Ave., Apt. 1B, Chicago, Ill. 60656

Continuation-in-part of Ser. No. 659,430, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,159, Sep. 4, 1975, Pat. No. 4,010,675, which is a continuation of Ser. No. 523,958, Nov. 14, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,423
Int. Cl.[2] F01C 1/24, 21/08, 21/12; F16J 1/24
U.S. Cl. 418—1 16 Claims



2. A rotary compressor comprising:
a cylinder-piston comprising a body and spaced arms extending from one end of said body, said spaced arms having opposing parallel surfaces and forming with said body of said cylinder-piston a U-shaped opening;
said cylinder-piston further having two side faces;
a piston positioned within said U-shaped opening of said cylinder-piston and having spaced faces adjoining said opposing parallel surfaces of said spaced arms of said cylinder-piston;
said piston further having two spaced side faces;
two axially spaced walls adjoining said side faces of said cylinder-piston and said spaced side faces of said piston;
a rotatable cylinder-piston shaft comprising an eccentric portion journaled in said body of said cylinder-piston;
a rotatable piston shaft comprising an eccentric portion journaled in said piston;
gearing means interconnecting said cylinder-piston shaft and said piston shaft so said shafts follow coordinated rotations in opposite directions and said cylinder-piston and said piston follow coordinated planetary rotations in opposite directions with and around said eccentric portions of said shafts;

said cylinder-piston and said piston forming moveable surfaces, and said axially spaced walls forming stationary surfaces of a compression chamber located between said body of said cylinder-piston and said piston and varying in volume upon said coordinated planetary rotations in opposite directions of said cylinder-piston and said piston;

intake means comprising an intake port leading to said compression chamber; and

discharge means leading from said compression chamber.

4,135,865

ROTARY VANE COMPRESSOR WITH OUTLET CHECK VALVE FOR START-UP PRESSURE ON LUBRICANT SYSTEM

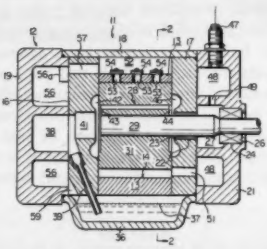
Haruhiko Takada, Konan-Mura, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1976, Ser. No. 711,339

Claims priority, application Japan, Aug. 6, 1975, 50-108896; Sep. 4, 1975, 50-122272

Int. Cl.[2] **F01C** *21/04, 21/12;* **F04C** *29/02;* **F16K** *31/08*

U.S. Cl. 418—93 **9 Claims**



1. In a rotary compressor comprising:

an outer shell means;

a housing disposed in said outer shell means, said housing being formed with a bore;

a fluid inlet passageway leading into the bore;

an end plate disposed at one longitudinal end of said housing;

an end cover mounted on the end plate;

a first fluid outlet chamber between the outer shell means and the housing;

a second fluid outlet chamber defined at least in part by said end cover and said end plate;

a third outlet chamber between the outer shell means and the housing;

an outlet port in said shell means leading from said third outlet chamber;

two passages in said end plate, one of the two passages communicating the first outlet chamber with the second outlet chamber and the other of the two passages communicating the second outlet chamber with the third outlet chamber;

a rotor operatively disposed in the bore in such a manner as to compressively displace fluid from the inlet passageway to the first outlet chamber upon rotation thereof, the rotor comprising a rotor body formed with a plurality of substantially radial slots and a plurality of vanes slidably retained in the slots respectively;

a lubricant reservoir communicating with the second outlet chamber;

a lubricant passageway leading from the lubricant reservoir to the inlet passageway and communicating with the rotor in such a manner that lubricant is caused to flow through the lubricant passageway when the pressure in the second outlet chamber is greater than a pressure in the inlet passageway to thereby lubricate the rotor, part of the lubricant passageway being defined by radially inner portions of the rotor slots so that the lubricant therein urges the vanes radially outwardly into sealing engagement with a wall of the bore; and

valve means provided in the other passageway and arranged to close thereby blocking communication between the second and third outlet chambers when the pressure in the first outlet chamber is below a predetermined value such that upon start up of the compressor, the valve means is closed to block off the third outlet chamber from the second outlet chamber and provide a reduced volume for compressed fluid between the rotor and the valve means to thereby effect rapid pressure built up in the radially inner portions of the rotor slots along with a corresponding urging force on the vanes urging the latter into sealing engagement with the wall of the bore.

4,135,866

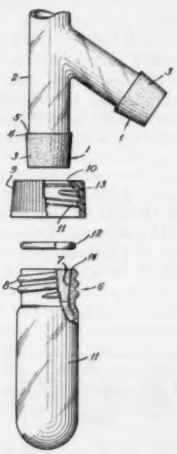
LABORATORY GLASSWARE TAPER CONNECTOR SYSTEM WITH RETAINER AND BACKUP SEAL

Lyle D. Winkler, Wauconda, Ill., assignor to Reliance Glass Works, Bensenville, Ill.

Filed Aug. 29, 1977, Ser. No. 828,761

Int. Cl.[2] **B01L** *3/00, 11/00*

U.S. Cl. 422—103 **3 Claims**



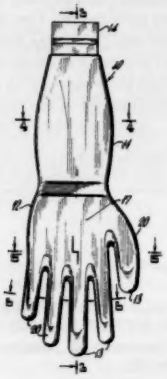
1. In a laboratory glassware taper connector system including first and second parts to be connected having respectively tapered male and female end portions in mating engagement to form a joint, said first part having an annular shoulder at the large end of the taper thereon, the improvement comprising a male screw thread formed on the end portion of said second part, an O-ring encircling said first part in engagement with said shoulder, and a cap having a female screw thread in the rim thereof adapted to mate with said male screw thread, said cap having a central hole in the top thereof leaving an annular flange extending inwardly from the top of said rim and engaging said O-ring, the diameter of said hole being approximately equal to but not less than the outside diameter of said shoulder, the arrangement being such that when said cap is screwed tightly upon said male thread the O-ring is compressed and presses against said shoulder to urge and maintain said male taper into tight engagement with said female taper of said connector system.

4,135,867

FORM FOR MAKING A GLOVE

Glenn F. Stockum, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.

Division of Ser. No. 724,491, Sep. 20, 1976, Pat. No. 4,047,251.
This application Apr. 13, 1977, Ser. No. 787,239
Int. Cl.[2] B29C *13/00*
U.S. Cl. 425—275 **3 Claims**



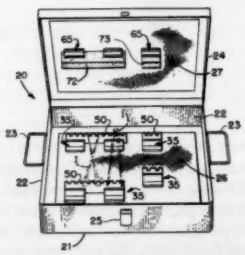
1. A form on which elastomeric material may be deposited for making gloves, said form having a hand-forming portion, a cuff-forming portion and a plurality of finger-forming portions, all of said finger-forming portions being oriented in substantially the same plane as said hand-forming portion, said finger-forming and hand-forming portions having a recess of uniform thickness formed in both sides thereof which extends into each of said finger-forming portions and which covers the entire surfaces of said hand-forming and finger-forming portions except for a peripheral edge which surrounds said recess.

4,135,868

SUPPORTS FOR INSTRUMENT STERILIZATION

Herbert Schainholz, 316 Locust St., Teaneck, N.J. 07666

Filed Apr. 5, 1977, Ser. No. 784,717
Int. Cl.[2] A61B *19/02;* **A61L** *3/00, 3/02*
U.S. Cl. 422—310 **5 Claims**



1. A support base for articles to be sterilized in a sterilization tray of the type having a supporting panel having a uniform pattern of apertures disposed in rows forming an array comprising, in combination, a baseplate member for said support base, said baseplate member having multiple resilient deformable protrusions projecting from one side of said baseplate member and mutually spaced to engage some of the apertures in a supporting panel of a tray to removably mount said article support base in a plurality of differently oriented positions on a supporting panel, each protrusion having a generally cylindrical configuration to allow repeatable insertions in selected apertures, said baseplate member having on its other side a body portion extending outwardly in a direction opposite to said protrusions, said body portion including mutually spaced apart outwardly extending members defining a slot therebetween, and article supporting plastic strip means having one edge inserted and frictionally retained in said slot and having an opposite edge extending away from said protrusions and notched for cradling a portion of an article to be sterilized, whereby said strip means can be cut to such length as required by the position of the support base.

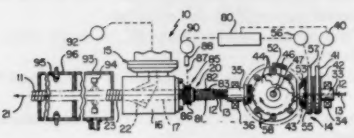
5. A hold down base for articles to be sterilized in a sterilization tray of the type having top and bottom sides movable from an open to a closed position, said sides having a plurality of apertures therein comprising, in combination, a baseplate member for said hold down base, said baseplate member having at least two resilient deformable protrusions projecting from said member for tightly engaging spaced apart apertures in a side of a tray to removably mount said hold down base thereon, each protrusion having a generally cylindrical configuration to allow repeatable insertion in a selected aperture, a block of resilient material, said baseplate member having a body portion extending outwardly in a direction opposite to said protrusions, said body portion including compression means for holding said block of resilient material under compression to removably mount said block in a position selected to allow said block to apply holding contact pressure against at least one article selectively disposed in a tray, said body portion having a slot therein and said compressing means including a fin member forceably inserted in said slot, said fin member having a pair of laterally extending arms, each of said arms having downwardly depending fingers, said block of resilient material being held under compression between said depending fingers.

4,135,869

APPARATUS FOR PRODUCING A CONTINUOUS FLEXIBLE TUBULAR CONDUIT

Philip K. Loyer, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Dec. 5, 1977, Ser. No. 857,739
Int. Cl.[2] B29D *23/05*
U.S. Cl. 425—71 **16 Claims**



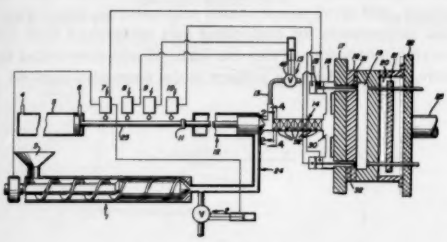
1. Apparatus for producing a continuous flexible tubular conduit having a plurality of helically wound reinforcing-electrical wires comprising; means for forming said wires into a corresponding plurality of substantially identical continuous non-rotating helical coils; an extruder head having an opening for receiving said coils therethrough; means extending into said opening for moving said coils through said opening with the coil turns of said coils coaxially aligned and alternately arranged; said moving means moving said coils in a rectilinear path substantially coinciding with said coaxial alignment; and means in said head for extruding a polymeric tube around said coils to define said conduit; said wire forming means comprising, a support assembly rotatably supporting a plurality of wire feed spools with their axes perpendicular to said rectilinear path, a plurality of feed wheels each having a peripheral recess therein for receiving an associated wire, means twisting said wires as they exit said feed wheels, means rotating said support assembly and feed spools about an axis substantially coinciding with said rectilinear path to assure said wires are free of entanglements during twisting thereof by said twisting means, and control means correlating the feeding of wires from said spools with said twisting means, rotating means, and moving means.

4,135,870

MACHINE FOR PRODUCING ADDITIVE CONTAINING PLASTIC ARTICLES

Clarence W. Wallace, Pittsfield, Mass., and Howard A. Koenig, Medina, Ohio, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 3, 1976, Ser. No. 692,339
Int. Cl.[2] B29F *1/12*
U.S. Cl. 425—130 5 Claims



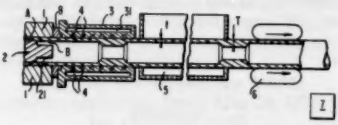
1. A machine for producing molded plastic articles containing an additive comprising: an extruder, a first and second passageway, an accumulator having a downstream end, a piston movable in said accumulator, a means operatively associated with said piston for moving said piston in said accumulator, a plurality of switches consisting of at least a first, a second, a third and a fourth switch, a means operatively associated with said piston movable in said accumulator for activating said plurality of switches in relation to the position of said piston in said accumulator, a means for introducing an additive, a valve in said means for introducing an additive, a mixer, a mold gate, and a valve in said mold gate, wherein: said first passageway connects said extruder to said accumulator; said second passageway connects said downstream end of said accumulator to said mixer which is adapted to connect to said mold gate; said means for introducing an additive is connected to said second passageway; and said plurality of switches are arranged to be activated sequentially from said first to said fourth switch in relation to preselected positions of said piston in said accumulator as said accumulator empties wherein: upon activation, said first switch is operatively associated with said piston in said accumulator to indicate that said accumulator is full and ready for injection; in the case when an additive is to be added only to the core of a plastic article then upon activation, said second switch is operatively associated to open said valve in said means for introducing an additive; upon activation said third switch is operatively associated to close said valve in said means for introducing an additive; and upon activation said fourth switch is operatively associated to close said valve in said mold gate; and in the case when an additive is to be added only to the skin of a plastic article then upon activation, said second switch is operatively associated to close said valve in said means for introducing an additive; upon activation said third switch is operatively associated with said movable piston in said accumulator to open said valve in said means for introducing an additive; and upon activation, said fourth switch is operatively associated to close said valve in said mold gate.

4,135,871

APPARATUS FOR MANUFACTURING RESIN TUBES ALTERNATELY HAVING A THICK WALL PORTION AND A THIN WALL PORTION

Sadao Murai, Hitakata; Takeshi Kita, Asaka, and Kiyoshi Mochizuki, Joyo, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 616,525, Sep. 24, 1975, Pat. No. 4,036,930.
This application Feb. 24, 1977, Ser. No. 771,494
Claims priority, application Japan, Sep. 24, 1975, 50/110803
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—377 4 Claims



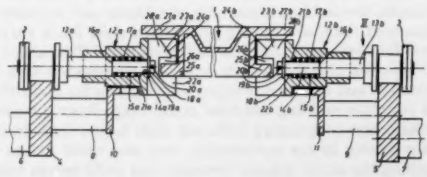
1. Apparatus for manufacturing resin tubes alternately having a thick wall portion and a thin wall portion in the same tube, and comprising: a fixed inner die and a fixed outer die together forming an orifice at the tip of an extruding machine of the type which extrudes resin at substantially a uniform speed; said orifice defining a fixed tubular opening at the extreme end of the extruding machine for forming said resin into a tube-like member, said tubular opening being divided into at least two stages along the direction of movement of said resin, one of said stages being a fixed small-width opening portion in the resin inlet part of said orifice and the second of said stages being a fixed large-width opening portion at the resin outlet part of said orifice, said large-width opening porion having an end portion open to the orifice; diameter control means in close contact with said tip surface for controlling one of the outside and inside diameters of the resin tube to be extruded; and pulling means, downstream of said orifice, for pulling said resin at high and low speeds respectively to cause said resin being extruded to fill only said small-width opening at said high speed and to fill both said small-width opening and at least the open end portion of the large-width opening at said low speed.

4,135,872

SUPPORTING DEVICE FOR POURING DIES, IN PARTICULAR FOR POURING DIES USED IN PLANTS FOR MAKING CHOCOLATE ITEMS

Renzo Cerboni, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed Jan. 27, 1977, Ser. No. 762,887
Claims priority, application Italy, Jul. 12, 1976, 25215 A/76
Int. Cl.[2] A23G *1/26*
U.S. Cl. 425—453 10 Claims



1. In a confectionery molding system the combination of a conveyor and a pouring die having a mold cavity detachably coupled therewith wherein said conveyor comprises first and second transversely spaced-apart chains, an elongated base component fixed in the outer portion thereof to each chain and projecting inwardly therefrom toward the opposite chain in transversely aligned relationship, a die-engageable member having a body portion slideably received on each base component, resilient means biasing the related die-engageable mem-

ber inwardly endwise of the associated elongated base component, a latch element provided at the inner end of each die-engageable member and constituting a keeper opening inwardly, said pouring die having a body and being disposed between the opposed die-engageable members, latch-forming flanges extending laterally from opposite sides of said pouring die for reception within the keepers of the proximate die-engageable members for effecting detachable coupling of said conveyor and said pouring die, each latch-forming flange having a cross-section less than the cross-section of the associated keeper to permit axial rocking and rotary movement of said latch-forming flanges within the associated keepers so that vibratory movement may be imparted to said pouring die without translation to said conveyor chains, said latch-forming flanges and said keeper being configured to prevent inversion of said pouring die by any reversal of direction of travel of said conveyor.

4,135,873

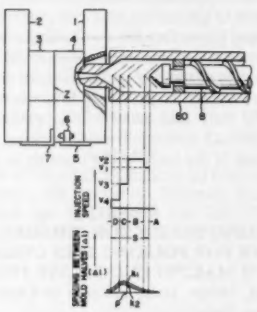
APPARATUS FOR CONTROLLING INJECTION MOLDING MACHINES

Tadatoshi Sone, and Kiyokazu Kayanuma, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 602,005, Aug. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 362,501, May 21, 1973, abandoned. This application Aug. 16, 1977, Ser. No. 825,137

Int. Cl.[2] B29F *1/06*

U.S. Cl. 425—147 **2 Claims**



1. In an injection molding machine of the type wherein plastic material is injectes into a mold includinc a pair of separable &old halves by means of an injection plunger having the stroke divided into a plurality of sections and actuated by pressurized fluid, and having pressurized fluid force varying means for varying the force of said pressurized fluid action on said injection plunger in each section in accordance with the position of said injection plunger, an apparatus for controlling said injection molding machine comprising detecting means having means cooperating with said mold halves for detecting means having means cooperating with said mold halves for detecting the actual spacing between said mold halves which occurs as a result of injection of the plastic material thereinto, a voltage generating means operatively connected to said injection plunger for generating a voltage proportional to the stroke of said injection plunger while it is operated successively through said sections, switching signal generating means for generating signals for effecting switching from one of said sections to the other, a plurality of signal generators respectively connected to said voltage generating means and corresponding ones of said switching signal generating means for responding to the voltage produced by said voltage generating means and to the signals generating control signals at the end of generating means for generating control signals at the end of the respective sections of said stroke of said injection plunger, a plurality of further signal generators for respectively generating reference signals representing predetermined permissible values of said spacing between said mold halves at respective check points in the respective sections of said stroke, a plurality of comparators connected to receive the output of said detecting means, gate means connected between said further signal generators and said comparators and connected to said firstmentioned signal generators and respectively controlled by said control signals for applying the outputs of said further signal generators to respective comparators, whereby said comparators compare the output from said detecting means with signals respectively generated by said further signal generators, and servo-motor means responsive to the outputs of said comparators for controlling said pressurized fluid force varying means for varying the force of said pressurized fluid acting on said injection plunger in the respective sections.

4,135,874

TWO STAGE COMBUSTION FURNACE

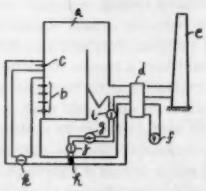
Shoichi Tsuzi, Hoya; Kiyoshi Aoki; Takeshi Sakai, both of Chiba; Hiroshige Ikebe, Kashiwa, and Dogi So, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Dec. 9, 1976, Ser. No. 748,884

Claims priority, application Japan, Apr. 8, 1976, 51-38795; Mar. 31, 1976, 51-35261

Int. Cl.[2] F23L *7/00*

U.S. Cl. 431—115 **1 Claim**



1. A combustion apparatus for carrying out two-stage combustion and exhaust gas recirculation combustion for reducing the emission of nitrogen oxides comprising a plurality of burners, a plurality of two-stage combustion air nozzles, two series of ducts for feeding combustion air to said burners and air nozzles, means for introducing exhaust gases into each of said ducts to mix said gases with the combustion air, a plurality of dampers positioned in said ducts for changing the volume ratio between the exhaust gases and the combustion air, and said dampers controlling the exhaust gas mixture ratio for the two-stage combustion air nozzles and the burners independently of each other, within the range between 0% and 100%, said burners including side walls and being arranged in a plurality of columns and a plurality of rows on said walls, said air nozzles being horizontally disposed in a row at and inwardly of the outermost burner columns and upwardly of the uppermost burner row by a suitable distance, and being spaced apart substantially the same distance as the interval between the burner columns, additional air nozzles disposed in the row of the above mentioned air nozzles and outwardly of the outermost burner columns, and means for controlling the rate of air flow to each air nozzle.

4,135,875

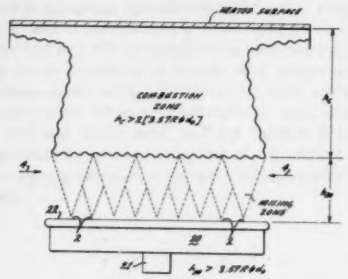
APPARATUS FOR BURNING GASEOUS FUEL

Earle W. Ballentine, 3641 Via Palomina Str., Palos Verdes Estates, Calif. 90274

Continuation-in-part of Ser. No. 727,578, Sep. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 419,514, Nov. 28, 1973, abandoned, and Ser. No. 687,663, May 19, 1976, abandoned, said Ser. No. 419,514, is a continuation-in-part of Ser. No. 376,405, Jul. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 250,589, May 5, 1972, abandoned, said Ser. No. 687,663, continuation-in-part of Ser. No. 610,564, is a continuation-in-part of Ser. No. 512,524, Nov. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 327,148, Jan. 26, 1973, abandoned. This application May 12, 1977, Ser. No. 796,424

Int. Cl.[2] F23D *13/40*

U.S. Cl. 431—354 14 Claims



1. A device for producing a combustible stoichiometric air-gas mixture comprising:

chamber means having a planar top surface and an inlet for connection to a source of gaseous fuel;

aperture means positioned in the planar top surface of the chamber means in a specific geometric array and wherein the lineal distances D_s between the apertures are identical and about equal to the product of the stoichiometric air-gas ratio R, being of the order of ten, and aperture diameter d_o, and whereby said product is multiplied by a constant of proportionality which has a value of 2.42, and said distance D_s being not smaller than about 2.4 Rd_o and not larger by 15% than 2.42 R d_o;

said distance D_s being considerably larger than d_o so that gaseous fuel discharging externally from the aperture means produce free turbulent jets which entrain the quantity of air required for stoichiometric combustion of the gaseous fuel and whereby the free turbulent jets coalesce in the stoichiometric demarcation plane which is parallel to the planar top surface of the chamber means and is located a distance above said planar top surface.

4,135,876

METHOD FOR SIMULTANEOUSLY CALCINING FIRST KIND OF PULVERIZED MATERIALS CONTAINING COMBUSTIBLE COMPOUNDS AND SECOND KIND OF PULVERIZED MATERIALS

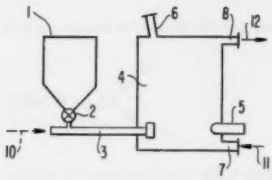
Norio Nakamura, Omiya; Satoshi Tominaga, Tama; Tsuneo Kobayashi, Ichikawa, and Mitsuo Nagaoka, Higashikurume, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote-machi, Japan

Filed May 3, 1977, Ser. No. 793,413

Claims priority, application Japan, May 25, 1976, 51-59639

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—14 2 Claims



1. A method for simultaneously calcining a first pulverized material containing combustible compounds and a second pulverized noncombustible material comprising the steps of:

(a) weighing a predetermined quantity of said first material containing combustible compounds and mixing with compressed air in such a way that the ratio of the weight of said first material to the weight of the compressed air may be between 8 and 10,

(b) spraying and swirling the mixture of said first material and the compressed air into a calcining combustion and heating chamber,

(c) charging said second pulverized material through an independent inlet into said combustion and heating chamber, and

(d) introducing combustion air into said combustion and heating chamber, thereby burning the combustible compounds in said first pulverized material, and mixing and calcining said first and second pulverized material.

4,135,877

PROCESS FOR IMPROVING ANTISTATIC AND HYGROSCOPIC PROPERTIES OF FIBERS OR FIBROUS STRUCTURES MADE THEREOF

Akira Aikawa, Nagahama; Masao Oguchi, Suita; Toshihide Takeda, Nagahama; Akio Kisaichi, Nagahama, and Toshio Saito, Nagahama, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 847,037
Claims priority, application Japan, Jun. 6, 1977, 52-67172
Int. Cl.[2] D06M *15/36*
U.S. Cl. 8—115.5 14 Claims

1. A process for improving the antistatic and hygroscopic properties of polyamide fibers or fibrous structures made thereof, which comprises heating polyamide fiber or fibrous structure made thereof at a temperature of from 95° to 130° C. while in contact with an aqueous treating solution consisting essentially of from 0.02 to 10% by weight of at least one water-soluble vinyl monomer selected from the group consisting of N,N'-methylene-bis-acrylamide and triacryloyl hexahydrotriazine, from 0.05 to 3.0% by weight of at least one acid selected from the group consisting of formic acid, monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, sulfuric acid, hydrochloric acid, nitric acid, phosphoric acid, acetic acid, tartaric acid and oxalic acid, and the balance is essentially water, said treating solution being free of polymerization initiator, whereby to graft polymerize said vinyl monomer with said polyamide.

4,135,878

EMULSIFIER-SOLVENT SCOUR COMPOSITION AND METHOD OF TREATING TEXTILES THEREWITH

Bruce J. Bishop, and Allen J. Moon, both of Macon, Ga., assignors to Star Chemicals, Inc., Macon, Ga.

Division of Ser. No. 719,153, Aug. 31, 1976, Pat. No. 4,106,901.
This application Apr. 10, 1978, Ser. No. 895,077
Int. Cl.[2] D01C *1/00;* D06L *1/00*
U.S. Cl. 8—139 17 Claims

1. An emulsifier-solvent scour composition which is stable in aqueous solutions containing at least 3% caustic at ambient temperatures and up to about 212° F., comprising from about 50 to 90% by weight of a solvent media of at least one inert organic solvent to provide a solvent media having an average kauri-butanol value of at least 45 and containing by weight about:

a) 5 to 35% of at least one phosphate ester of a 30 to 75% ethoxylated and/or propoxylated C_8–C_{24} aliphatic or aromatic alcohol;

b) 1 to 10% of at least one C_8–C_{24} carboxylic acid or salt thereof; and

c) 4 to 20% of either

(i) at least one member from the group consisting of a sulfonated C_8–C_{24} fatty acid or salt thereof, a 30–75% ethoxylated and/or propoxylated ester of a C_8–C_{24} carboxylic acid, a 30–75% ethoxylated and/or propoxylated glyceride of a C_8–C_{24} hydroxy containing carboxylic acid, and a sulfonated C_1–C_{18} alkyl diphenyl oxide or salt thereof;

(ii) at least one of a 30–75% ethoxylated and/or propoxylated C_8–C_{24} aliphatic or aromatic alcohol, primary or secondary amine or mercaptan; sulfonated C_1–C_{18} alkyl benzene or salt thereof; and a C_8–C_{24} fatty diethanol amide.

4,135,879

PROCESSES FOR THE TREATMENT OF TEXTILES AND FINISHING AGENTS FOR USE THEREIN

Kaspar D. Hasenclever, Taunusstein, Fed. Rep. of Germany, assignor to Chemische Fabrik Kreussler & Co., GmbH, Wiesbaden-Biebrich, Fed. Rep. of Germany

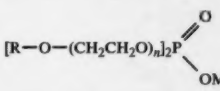
Continuation-in-part of Ser. No. 558,547, Mar. 14, 1975. This application Dec. 17, 1976, Ser. No. 751,601
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1974, 2412175
Int. Cl.[2] D06M *13/32*
U.S. Cl. 8—142 7 Claims

1. A process for the treatment of a textile fabric for improving its hand, fullness, flexibility, wrinkle recovery, and ease of cleaning which process comprises applying to the surface of the fabric a solution of a finishing agent selected from the group consisting of

phosphoric acid esters of poly(oxyethylene) alkanols having the formula:

$$[R—O—(CH_2CH_2O)_n]_3P=O$$

and mixtures of these esters with salts having the formula



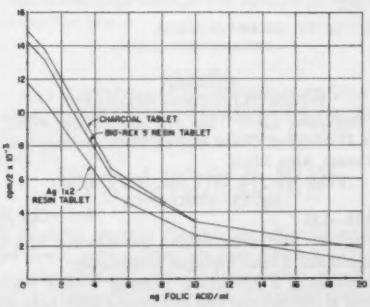
in which formulae R is a straight-chain alkyl radical having at least 16 and at most 18 carbon atoms, *n* is an integer of at least 10 and atmost 14 and Me is a monovalent metal ion.

4,135,880

FOLATE ASSAY WITH ION EXCHANGE RESIN BOUND-FREE SEPARATION

Vito J. Mangiardi, San Rafael; Henry J. Jeong, Sacramento, and Nathan Lewin, Corte Madera, all of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Aug. 19, 1977, Ser. No. 826,006
Int. Cl.[2] G01N *33/16, 31/06*
U.S. Cl. 23—230 B 12 Claims



1. In a competitive binding assay for serum folate including the step of separating unbound serum folate from serum folate bound by a folate-selective protein, the improvement comprising separating unbound serum folate by removal with an anion exchange resin.

4,135,881
METHOD AND APPARATUS FOR DETERMINING THE THERMAL CRACKING BEHAVIOR OF HYDROCARBON FEEDS FOR CRACKING FURNACES

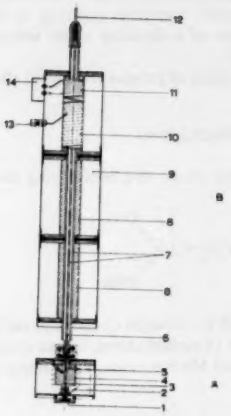
Cornelis A. C. L. Bakx; Jacobus T. J. van Goolen; Jacobus Jansen, and Hubertus G. Kuiper, all of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Oct. 5, 1977, Ser. No. 839,741

Claims priority, application Netherlands, Oct. 6, 1976, 7611006

Int. Cl.[2] G01N *31/12*

U.S. Cl. 23—230 PC **19 Claims**



1. A method for determining the thermal cracking behavior of hydrocarbon feedstocks for industrial cracking furnaces, which method comprises the steps of,

(a) injecting a liquid sample of the hydrocarbon feedstock into a heated evaporation chamber,

(b) vaporizing said sample in said chamber,

(c) diluting said vaporized sample with an inert gas fed into the evaporation chamber forming mixed inert gas/hydrocarbon feedstock vapors which has a partial pressure of the hydrocarbon which corresponds to the partial pressure of the hydrocarbon feedstock in the industrial cracking furnace,

(d) propelling the said mixed inert gas/hydrocarbon feedstock vapors by means of an inert gas into a mono-turbular furnace of capillary dimensions,

(e) cracking said diluted vaporized sample into its constituents, and

(f) analyzing the cracked products.

4,135,882
FOAM INJECTION NOZZLE

Jack W. Harkness, 12403 72nd St., Alto, Mich. 49302, and Maurice P. Mefford, Grand Rapids, Mich., assignors to Jack W. Harkness, Alto, Mich.

Filed Mar. 14, 1977, Ser. No. 776,835

Int. Cl.[2] B29D *27/02*

U.S. Cl. 422—133 **10 Claims**

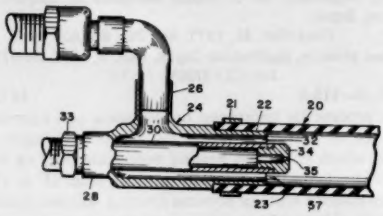
1. A nozzle for use in the mixing and injection of a liquid foaming agent and a resin hardener comprising:

a body including a cylindrical chamber with a discharge opening at one end and first and second inlets spaced from said one end;

a hollow injection tube coupled to said first inlet and extending axially through said chamber, said tube having an outer diameter less than the inner diameter of said chamber to define an annular space between said tube and cylindrical chamber, said tube including an injector at an end which extends beyond the discharge opening of said body;

means for supplying liquid resin to said injection tube at an end remote from said injector;

means for supplying foaming agent to said second inlet of



said body and said chamber in the annular space surrounding said injection tube; and

a flexible injector hose removably coupled at one end to said discharge opening of said body for the mixing of the foaming agent and resin hardener within said hose and the discharge of the mix therefrom.

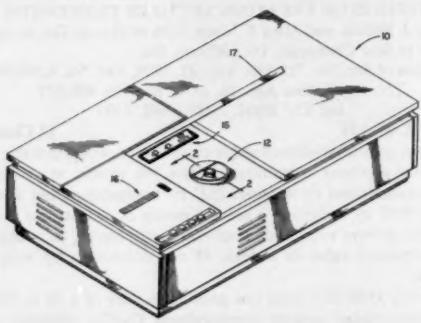
4,135,883
BLOOD ANALYZER SYSTEM

Mark D. McNeil, Irvine; Robert H. Goldstein, Tustin, both of Calif.; Robert M. Stahl, and Sandra L. Piepho, both of Indianapolis, Ind., assignors to Bio-Dynamics Inc., Indianapolis, Ind.

Filed Aug. 29, 1977, Ser. No. 828,522

Int. Cl.[2] G01N *33/16*

U.S. Cl. 422—72 **25 Claims**



1. Apparatus for performing chemical tests comprising:

(a) a centrifuge having a rotor, said rotor including cuvette-retaining means;

(b) a cuvette having a test chamber portion therein and test information coding thereon, said cuvette being mountable into said cuvette-retaining means;

(c) a spectrophotometer mounted on said centrifuge and adapted to read the test chamber portion of said cuvette;

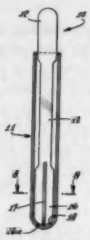
(d) means for reading the test information coding on said cuvette, said code reading means being mounted on said centrifuge;

(e) and means for receiving the signal from said code reading means and from said spectrophotometer and for displaying the test result appropriate for said test information coding.

4,135,884
GAMMA STICK

James T. Shen, 940 Cornell Rd., Pasadena, Calif. 91106

Filed Aug. 29, 1977, Ser. No. 828,542
Int. Cl.[2] G01N 33/16
U.S. Cl. 422—59 1 Claim



1. For use in clinical assays, the combination com ising a test tube and a test stick inserted in the test tube th ontains antigen solution, the tube having an upwardly conc ottom wall the stick comprising

(a) an elongated plastic member having a test ion inserted into said solution in the test tube,

(b) said test portion defining surface area at lea out as great as the test tube bore surface extending abo aid test portion,

(c) said test portion coated with antibody to contact said solution,

(d) said test portion defining multiple flutes arranged in opposed pairs, each such pair having lowermost edges which are downwardly generally convex in matching relation to the upward concavity of said tube bottom wall,

(e) the uppermost extent of the stick projecting upwardly from the uppermost top level of the tube when said flute lowermost edges are adjacent the tube bottom wall,

(f) said member having opposed parallel faces and being flat above the level of the flutes, two of said flutes having opposite surfaces in the same planes as are defined by said opposed parallel faces,

(g) said stick being narrowed in width between said uppermost extent and said flutes.

4,135,885
BURNING AND DESULFURIZING COAL

Alex F. Wormser, Marblehead, and Stephen P. Perkins, Beverly, both of Mass., assignors to Wormser Engineering, Inc., Lynn, Mass.

Filed Jan. 3, 1977, Ser. No. 756,265
Int. Cl.[2] C01B 17/02, 17/06; C01J 3/54
U.S. Cl. 422—142 5 Claims

1. Apparatus for burning and desulfurizing coal which comprises

vessel means providing

a first fluid bed zone for combustion therein of coal and

a second fluid bed zone downstream of said first fluid bed zone for desulfurization therein of gaseous products of said combustion;

means for feeding coal, including

coal distribution means extending horizontally in said vessel for distribution of said coal over the area of said first fluid bed zone,

coal inlet means connected to supply said coal distribution means, and

means for introducing air, including

fluidizing air distribution means within said vessel and extending horizontally across the upstream end of said first fluid bed zone to fluidize therein said coal and an incombustible particulate, and

air inlet means connected to said fluidizing air distribution means to supply said air;

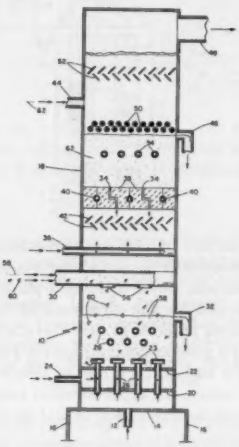
support means extending within the vessel horizontally and cooperating with said air inlet means to define the upstream end of said first fluid bed zone, and hold thereover a fluidized bed mixture of said coal and said particulate for burning of said coal in said air while in said mixture;

first outlet means from said first fluidized bed zone for removal therefrom of ash produced in said burning;

heat transfer conduit means positioned in said first fluidized bed zone above said fluidizing air distribution means for removing from said first fluidized bed zone heat energy produced in said burning;

fluidizing combustion gas distribution means extending horizontally across the upstream end of said second fluid bed zone;

support means extending within the vessel horizontally and



cooperating with said combustion gas distribution means to define the upstream end of said second fluid bed zone, and hold thereover a fluidized bed of sorbent for desulfurization thereby of said combustion gas during passage thereof therethrough;

conduit means from the downstream end of said first fluid bed zone to supply combustion gas to said fluidizing combustion gas distribution means;

sorbent inlet means for delivery therethrough of sorbent to said second fluidized bed zone;

second outlet means for discharge from said second fluidized bed zone of spent sorbent; and a

third outlet means downstream of said second fluidized bed zone for discharge through said third outlet means of said combustion gas.

4,135,886
CATALYTIC REACTION CHAMBER FOR GRAVITY-FLOWING CATALYST PARTICLES

Paul J. Kuchar, Hinsdale, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 5, 1977, Ser. No. 822,163
Int. Cl.[2] B01J 8/12; C10G 35/12
U.S. Cl. 422—216 5 Claims

1. A catalytic reaction chamber for affecting contact of a reactant stream with catalyst particles which are (1) disposed as an annular-form bed and, (2) downwardly movable therethrough via gravity-flow, said reaction chamber comprising, in cooperative relationship:

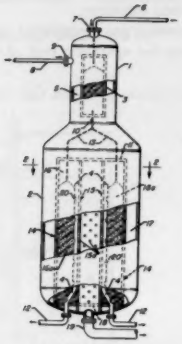
(a) a perforated catalyst-retaining screen (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said chamber to provide a reactant stream manifold space therebetween;

(b) a perforated centerpipe (i) concentrically-disposed

within and, (ii) having a cross-sectional area less than said catalyst-retaining screen to provide said annular-form catalyst bed therebetween;

(c) a plurality of catalyst inlet conduits connected to the upper portion of said chamber and communicating with said annular-form catalyst bed;

(d) a plurality of vertically-positioned catalyst-transfer conduits (i) circumferentially-disposed substantially adjacent



the outer surface of said perforated center-pipe, (ii) extending substantially the entire length of said annular-form catalyst bed and, (iii) containing a plurality of apertures facing into said annular-form catalyst bed and sized to permit catalyst particles to flow therethrough; and,

(e) said catalyst transfer conduits having a plurality of internal, inclined baffles, each one of which extends downwardly to reduce the cross-sectional area of the catalyst transfer conduits above each of said apertures.

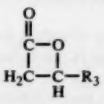
4,135,887

FLOW IMPROVERS FOR CRUDE AND RESIDUAL-CONTAINING FUEL OILS

Albert Rossi, Warren, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 16, 1977, Ser. No. 833,968
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—62 **8 Claims**

1. An oil composition comprising a major amount of petroleum oil selected from the group consisting of residua-containing fuels boiling above 315° C. and comprising about 5 to 100% by weight of residua, distillate fuels boiling above 315° C. and crude oils, said petroleum oil being improved in its Flow Point by at least a flow improving amount of an oil-soluble, flow improving substantially equimolar condensation copolymer of a 1,2 epoxy alkane having a linear alkyl group of 10 to 50 carbon atoms, and a cyclic carboxylate compound selected from the group consisting of alpha-beta C_4–C_{10} monounsaturated dicarboxylic acid anhydrides, said acid anhydrides substituted with a linear C_{10}–C_{50} hydrocarbyl group, and beta lactones of the general formula:



wherein R_3 is selected from the group consisting of hydrogen and C_1–C_{50} alkyl groups, wherein said condensation copolymer is characterized by straight chain, pendant alkyl groups of 10 to 50 carbons and a number average molecular weight in the range of about 750 to 50,000.

4,135,888

ENRICHED FUEL MAKING AND SEWAGE TREATING PROCESS

Owen R. Waltrip, Roseville, Calif., assignor to Nuclear Supreme, Casper, Wyo.

Filed Sep. 20, 1977, Ser. No. 835,022
Int. Cl.[2] C10L *5/00, 9/00*
U.S. Cl. 44—1 D **9 Claims**

1. In a process for producing a solid fuel from a slurry formed from raw sewage and particulate coke, the steps of: conducting said slurry through a plurality of pressure sealed zones in series; physically agitating the slurry during movement through said zones; injecting super-heated steam into said zones during said movement of the slurry therethrough to release only non-noxious gases and volatiles leaving a liquid depleted residue; compacting the residue discharged under pressure from the zones within a reaction zone; injecting hydrogen gas into the reaction zone during compaction of the residue to form a compacted mass; and cooling said compacted mass to form the solid fuel product.

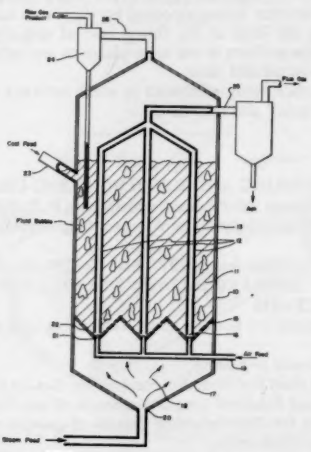
5. A method of continuously treating raw sewage and enriching a relatively low energy content solid fuel, comprising the steps of: grinding said solid fuel into particles; mixing said particles with the raw sewage to form a slurry; mixing the slurry during movement with super-heated steam until non-noxious gases and volatiles are evolved therefrom, leaving a liquid depleted mass; exposing said mass to a reactive gas other than steam; and compacting said mass into a solid fuel product.

4,135,889

SINGLE STAGE, COAL GASIFICATION REACTOR

Shuji Mori, Lexington, Ky., assignor to University of Utah, Salt Lake City, Utah

Filed Dec. 20, 1976, Ser. No. 752,348
Int. Cl.[2] C10J *3/48*; B01J *8/18*
U.S. Cl. 48—73 **17 Claims**



1. A single stage, fluidbed coal gasification reactor comprising:

a. a closed shell side having enclosing wall structure for containing a fluid bed of particulate carbonaceous material;

b. a tube side comprising the volume within an enclosing tube which is positioned within said shell side in substantial upright orientation, said tube side being substantially segregated from said shell side except for an opening at the lower end of said tube which permits transfer of said carbonaceous material from the shell side to the tube side during operation of the reactor;

c. means for introducing shell side reactant fluid at the base

of said shell side to actuate a fluid bed state of the particulate carbonaceous material therein;

d. means for introducing a high flow of oxygen containing fluid into said lower tube opening,

e. means adapted for actuating a combustion reaction between said contained oxygen and said carbonaceous material within said tube side, and

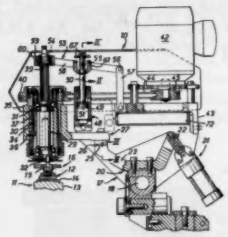
f. means for separately removing gaseous products from the respective shell and tube sides of the reactor.

4,135,890

MACHINES FOR SURFACING LENSES

Pierre Billault, Bry-sur-Marne, France, assignor to Essilor International Cie Generale d'Optique, Joinville-le-Pont, France

Filed Sep. 30, 1977, Ser. No. 838,358
Claims priority, application France, Oct. 6, 1976, 76 30009
Int. Cl.[2] B24B *13/02*
U.S. Cl. 51—124 L **11 Claims**



1. A working head for a machine for surfacing lenses, said working head comprising a pivotally mounted arm, a supporting finger generally axially movably mounted on said arm, actuating means wholly carried by said arm and arranged to urge said supporting finger towards a working station, said actuating means comprising a pneumatically controlled piston slidable within a cylinder and resilient means, a casing rigidly fixed to said pivotally mounted arm, a pin mounted within said casing and being axially slidable with respect to said casing, said pin carrying said supporting finger, and a lever, a first point of said lever being coupled to said pin, a second point of said lever being operatively connectable to said piston and a third point of said lever being hingedly connected to said pivotable arm, and said resilient means being operative between said piston and said lever.

4,135,891

PURIFYING EXHAUST GASES CONTAINING ORGANIC AND INORGANIC MATERIALS

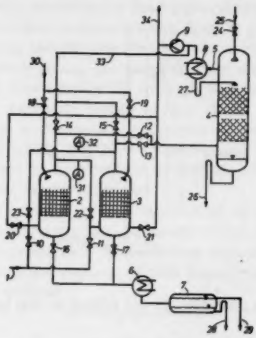
Gotz-Gerald Börger, Monheim; Adam Jonas, Leichlingen, and Rolf Germerdonk, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 11, 1977, Ser. No. 841,235
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649269
Int. Cl.[2] B01D *53/04, 53/14*
U.S. Cl. 55—59 **4 Claims**

1. A process for purifying exhaust air streams which contain inorganic acid or basic substances together with organic substances, by absorption of the inorganic substances in aqueous solutions and adsorption of the organic substances on active carbon, comprising

(a) presaturating active carbon with the inorganic substances present in the exhaust air with simultaneous dissipation of the heat of adsorption liberated, and

(b) contacting the exhaust air stream with said active carbon, thereby selectively to adsorb the organic substances and leave residual exhaust air,



(c) contacting the residual exhaust air with an absorbent for the inorganic substances, the resulting absorbent being substantially free of said organic substances.

4,135,892

MACROPOROUS POLYMERIC SORBENTS FOR CHROMATOGRAPHY, ESPECIALLY GAS CHROMATOGRAPHY OF ORGANIC COMPOUNDS

Jiří Čoupek; Jaromír Lukáš; Jiří Hradil, and Miroslava Kriváková, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jul. 15, 1976, Ser. No. 705,422
Int. Cl.[2] B01D *15/08*
U.S. Cl. 55—67 **5 Claims**

1. The method of separating mixtures of organic compounds selected from the group consisting of mixtures of nitrogen-containing heterocyclic compounds, mixtures of cycloaliphatic and aromatic hydrocarbons, mixtures of aliphatic hydrocarbons, mixtures of lower aliphatic alcohols and mixtures of lower fatty acids which comprises passing such a mixture with a carrier gas through a column at a column temperature of 125°–185° C., said column being packed with a macroporous polymeric sorbent, which is a terpolymer of:

(a) 1.19–31.60 wt.% of a hydroxyl containing monomer selected from the group consisting of hydroxyalkyl acrylates and hydroxyalkyl methacrylates in which the alkyl group contains 1–6 carbon atoms;

(b) 8.39–21.95 wt.% of a monomer selected from the group consisting of alkyl acrylates and alkyl methacrylates in which the alkyl group contains 1–18 carbon atoms; and

(c) 60.01–88.02 wt.% of a crosslinking monomer selected from the group consisting of alkylene diacrylates and alkylene dimethacrylates in which the alkylene group contains 1–6 carbon atoms.

4,135,893

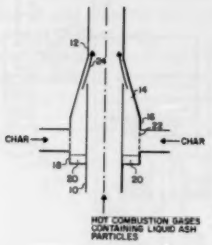
MIXING METHOD AND DEVICE

Alan G. Roberts, Dorking, England, assignor to Cogas Development Company, Princeton, N.J.

Filed Jul. 8, 1974, Ser. No. 486,501
Int. Cl.[2] B01D *53/00*
U.S. Cl. 55—82 **1 Claim**

1. In the method of gasifying carbon with steam in a fluidized bed, in which the heat of gasification is supplied by a recycling stream of carbon which is heated externally of the bed by being entrained in a lift tube in a hot stream of combustion gases containing molten ash particles, the improvement which comprises feeding the hot stream of combustion gases centrally into the lift tube while feeding a stream of recycle carbon into the lift tube so as to provide an annulus of fluidized recycle carbon initially surrounding the stream of combustion

gases, whereby the molten ash particles mix with the recycle carbon and are thereby cooled and solidified before they reach



the tube wall so that they do not adhere to and buildup in said tube wall.

4,135,894

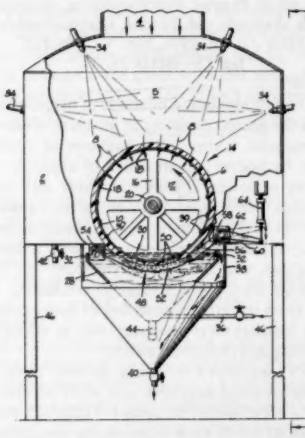
AIR FILTRATION APPARATUS AND METHOD OF OPERATION THEREOF

Richard C. Himes, and Bruce G. Craig, both of Littleton, Ohio, assignors to Andersen 2000, Inc., College Park, Ga.

Continuation of Ser. No. 590,299, Jun. 25, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,944

Int. Cl.[2] B01D *47/00*

U.S. Cl. 55—91 **10 Claims**



1. A method of removing micron and submicron liquid and solid particulate matter entrained in a gas stream comprising the steps of:

forcing the gas stream with the micron and submicron liquid and solid particulate matter entrained therein through a filter medium at a gas velocity at the upstream face of the filter medium in excess of 500 feet per minute and at a pressure drop across the filter medium greater than ten inches water gauge, where the filter medium has a thickness of about 0.5–2.0 inches and a void fraction in excess of ninety percent, and where the filter medium comprises a three-dimensional network of interconnected strands of material with the strands being integrally connected at spaced apart nexus to form a skeletal outline of a multitude of interconnected open cells with each opening to each cell common to an adjacent cell;

spraying a wash liquid onto the upstream face of the filter medium so that the sprays of wash liquid substantially uniformly cover the upstream face of the filter medium to keep the strands of the filter medium wetted with the wash liquid and so that the wash liquid migrates through the filter medium in the direction of gas flow to be blown off the downstream side as wash liquid droplets, the liquid and solid particulate matter being separated from the gas stream upon contact of the liquid and solid particulate matter with the wash liquid wetting the strands of the filter medium so that the separated liquid and solid particulate matter is carried in the wash liquid and is moved through the filter medium in the wash liquid to be removed from the downstream side of the filter medium in the wash liquid droplets; and

subsequently passing the gas stream and the particulate matter laden wash liquid droplets through a mist separation device after passage of the gas stream through the filter medium to separate substantially all of the particulate matter laden wash liquid droplets from the gas stream.

4,135,895

PUMP CONSTRUCTION FOR THE TREATMENT OF GASES WITH A SORBENT MATERIAL

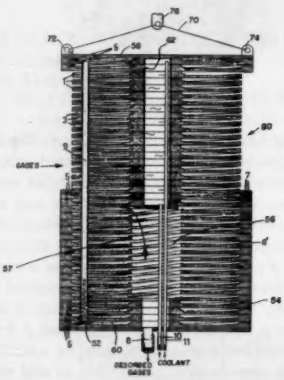
Thaddäus Kraus, Triesen, Liechtenstein, assignor to Balzers Patent- und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed Aug. 26, 1977, Ser. No. 828,183

Claims priority, application Switzerland, Sep. 7, 1976, 011322/76

Int. Cl.[2] B01D *53/06*

U.S. Cl. 55—181 **10 Claims**



1. A pump for the treatment of gases with a sorbent in an evacuated chamber, comprising a housing having a plurality of stacked plates defining a continuous upwardly extending path of successive spirals for the sorbent material, the sorbent material being distributed along at least a portion of the path, at least some of said spirals being spaced apart to define a sorption chamber permitting the passage of gases to be treated over the sorbent material, said stacked plates further defining a closed path in said housing leading from said sorption chamber and out of said housing for discharging the sorbed gases, drive means for vibrating said housing applied to effect an upward movement of said sorbent material along said path, and return means for the sorbent material extending downwardly from a location adjacent the top of said path to the location adjacent the bottom of said path, said stacked plates comprising central hub portions which interfit and have an opening therein defining a cooling chamber and have spiral path forming outer portions which are spaced apart at their peripheries for the passage of a gas therethrough.

4. A sorption vacuum pump comprising a vertical stack of a plurality of first lower plates having outer peripheral ring portions which are interengaged and spiral inner portions which define a portion of an upward spiral path for sorption material and with an inner open space defining a heating chamber portion, the sorption material being distributed along at

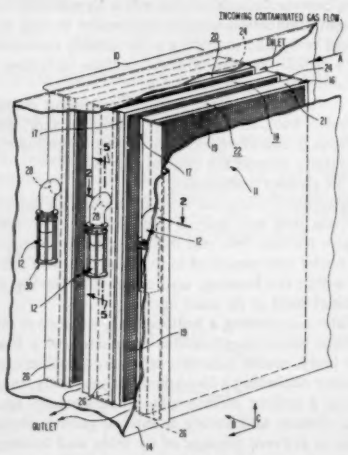
least a portion of the path, a plurality of second plates stacked on said first plates and having outer and inner ring portions which are interfitted together to close off each outer and inner end with an intermediate spiral path continuing upwardly from the spiral path defined by said first plates and a third set of plates having only inner ring portions which interfit and close off the inner ends and have spiral path portions which connect to the lower spiral path portions of said first and second plates, the inner rings fitting together to define a central cooling chamber along with said second plates, means separating said cooling chamber from said heating chamber defined by said first plates, the spaces between said third plates defining a path for the passage of gases to be desorbed by the sorption material therein and the spiral path being provided for the sorbent material, a return conduit extending from the uppermost one of said plates to the lowermost one of said plates for returning sorbent material which is fed to the uppermost plate, means for vibrating said housing to cause movement of said sorbent material upwardly along said spiral path of said first, second and third plates.

4,135,896

GAS PURIFIER HAVING RECHARGEABLE ADSORBER FILTER WITH REMOVEABLE RECHARGEABLE SAMPLE CANISTER

Harold C. Parish, Dublin; Ivars S. Spulgis, Columbus; Thomas N. Hickey, Worthington, and David R. Hoy, Grove City, all of Ohio, assignors to CVI Corporation, Hilliard, Ohio

Filed Dec. 11, 1975, Ser. No. 640,108
Int. Cl.[2] B01D *53/30*
U.S. Cl. 55—270 **26 Claims**



1. Sample canister apparatus, for use with an associated adsorber filter having a plurality of vertically oriented vertically rechargeable filter assemblies for containing granular adsorbent material for horizontal gas flow therethrough, for containing sample adsorbent material of the same type as contained in said filter assemblies and for exposing any said sample adsorbent material contained therein to gas flow for single-stage filtering of said gas, a portion of said sample canister apparatus being removable from said associated adsorber filter without disturbing structural integrity of said adsorber filter and without disturbing any adsorbent material in said adsorber filter, comprising:

(a) an imperforate conduit having inlet and outlet ends with a right-angle bend therebetween, said inlet inlet end connected in fluid-tight relation to said associated adsorber filter to receive horizontally flowing gas therefrom which gas has yet to pass through said filter assemblies; and

(b) a generally vertically oriented imperforate straight tube, of length at most equal to the minimum distance for horizontal gas flow through granular adsorbent material in one of said filter assemblies in said associated absorber filter, having inlet and outlet ends, said tube inlet end removably connected in fluid-tight relation to said conduit outlet end to receive vertically flowing gas therefrom, for containing sample granular adsorbent material for exposure thereof to any gas received from said conduit as any said gas flows vertically through said tube, said tube including perforate means at said outlet end thereof for retaining a free-standing column of sample adsorbent material within said tube by preventing vertically downward flow of any column of sample adsorbent material contained therewithin; and

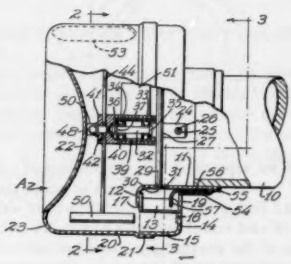
(c) sample granular adsorbent material, of the same type as said adsorbent material contained within said filter assemblies, disposed as a free-standing uncompressed column occupying the entirety of said imperforate straight tube interior volume.

4,135,897

AIR CLEANER

John T. Gondek, P.O. Box 21013, Minneapolis, Minn. 55421

Continuation-in-part of Ser. No. 686,148, May 13, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 846,727
Int. Cl.[2] B01D *45/12*
U.S. Cl. 55—404 **9 Claims**



1. An air cleaner including concentric first, second and third cylindrical sleeve means, said first sleeve means providing an outlet and said second sleeve means having a larger diameter than said first sleeve means and having flange means so as to provide a ring-shaped inlet therebetween and said third sleeve means having substantially the same diameter as said second sleeve means and providing an axial extension of said second sleeve means, the end of said third sleeve means remote from said second sleeve means being closed,

the cross sectional area of said first sleeve means being less than the cross sectional area between said first and second sleeve means whereby air passing between said first and second sleeve means and through said third sleeve means will travel at a lower linear speed than air passing through the outlet formed by said first sleeve means,

means adjacent said inlet for imparting a swirling motion of air entering said inlet and for controlling the linear speed of air through said inlet including a series of angularly spaced vanes, means resiliently mounting each of said vanes at only one end for normally urging the opposite end thereof toward the said one end of the next vane adjacent thereto, the distance between said one end and said other end of each vane being generally sufficient so that said vanes can flex substantially closed when the suction in the outlet decreases sufficiently and to flex open to admit air required as the suction in the outlet increases,

a plurality of radially extending arms having blower blades supported at the outer ends thereof,

means rotatably mounting said blower arms within said third sleeve means so that said blades are nearer said third sleeve means and generally in the path of air flowing from

said second sleeve means, said blades being coaxially arranged with respect to said third sleeve means,

a plurality of radially directed turbine blades on said means which rotatably mounts said blower arms, said turbine blades being located radially inwardly of said blower blades nearer said first sleeve means whereby air entering said first sleeve means engages said turbine blades to help rotate said blower blades in a manner to increase the centrifugal force of particles entrained in the air outwardly in the direction of said third sleeve means, said third sleeve means having a discharge opening through which said particles may pass.

4,135,898

DEVICE FOR CENTRIFUGALLY SEPARATING THE COMPONENTS OF A GAS MIXTURE

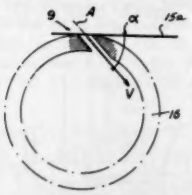
Alex Rosengard, Gif-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 15, 1976, Ser. No. 732,789

Claims priority, application France, Oct. 24, 1975, 75 32643; Jun. 28, 1976, 76 19593

Int. Cl.[2] B01D *51/00*

U.S. Cl. 55—419 **13 Claims**



1. A device for separating the components of a gas mixture, in which said mixture passes through a vessel having an axis of revolution and forms therein a vortex whose axis coincides with the axis of said vessel, wherein a plurality of openings for the admission of the mixture are spaced at intervals over the entire surface of said vessel except for its ends and wherein means for withdrawing fractions enriched in one of the components of the mixture are located in the ends of the vessel and are centered on the axis thereof, said device comprising:

a stationary hollow vessel of substantially cylindrical shape, the directrix of said cylinder being a circle having a radius a, said cylindrical vessel being provided on the lateral surface thereof with a network of injection openings in the form of a series of helically skewed slits parallel to each other for establishing communication between the interior of the cylindrical vessel and a source of gas mixture under pressure, the intersection of a transverse section plane of said cylinder with the median skewed plane of each slit being always a straight line at a substantially constant angle α with the plane which is tangent to the vessel at their common intersection with the respective transverse section plane, the ends of the slits intersecting their respective median skewed planes in lines making a substantially constant angle β with the transverse section planes of the vessel, said cylindrical vessel being closed at both ends respectively by two covers, the network of the points of intersection of the respective median lines of said slits and said lateral surface of said vessel forming at least one parallelogram at least two sides of which are curvilinear, first means for collecting a first fraction of the gas mixture which is discharged through a first extraction opening of each said cover, said extraction opening being located in the vicinity of the axis of said cylindrical vessel, and second means for collecting the gases which are discharged through at least one second extraction opening located between said first extraction openings and the periphery of the respective cover, in which said at least one of the second extraction openings is situated, and spaced from said periphery of the cover to isolate gases removed from the cover with respect to gases admitted to the vessel.

4,135,899

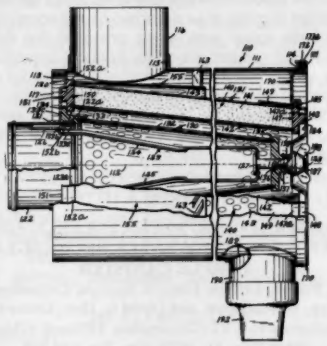
SAFETY FILTER FOR AIR CLEANER

Daniel S. Gauer, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed May 25, 1977, Ser. No. 800,192

Int. Cl.[2] B01D *50/00, 46/24*

U.S. Cl. 55—482 **8 Claims**



1. A filter, comprising a hollow body of porous material, having the shape of a truncated circular cone having an axis extending between a smaller end and a larger end;

a resilient connection annulus connected to said larger end of said body and including a flat axially outward surface and a radially inward concave surface including a medial circumferential groove;

and a centrally apertured resilient mounting member connected to and substantially occluding the small end of said body, said mounting member having a central lip extending axially around the central aperture.

3. An air cleaner comprising:

(a) a generally cylindrical housing having an axis extending between first and second ends, an air inlet, and a fixed closure for said first end including an axial aperture;

(b) an outlet tube mounted in the axial aperture and projecting within the housing, said outlet tube having a circumferential bead at its inner end;

(c) a filter comprising a hollow body of porous material, a resilient connecting annulus connected to a first end of said body, and a centrally apertured resilient mounting member occluding a second end of said body, said annulus having a sealing surface which bears axially against said fixed closure, and having an inward groove engaging said bead, to prevent passage of air from said housing to said outlet tube passed the first end of said filter;

(d) means mounting said filter within said housing comprising a mounting yoke having legs secured to the inside of said outlet tube, said yoke extending axially of said housing through said filter and including a shaft passing outwardly through the aperture of said mounting member supporting said filter coaxially in said housing;

(e) and clamping means securing said mounting member frictionally to said shaft.

4,135,900

GAS FILTER DEVICE

Karl Westlin, and Charles E. Rose, both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed May 31, 1977, Ser. No. 802,265

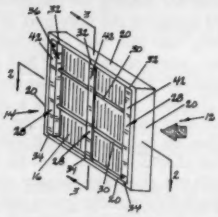
Int. Cl.[2] B01D *46/40*

U.S. Cl. 55—499 **11 Claims**

1. In a filter device comprising a pleated filter media wherein

alternating pleats open to the upstream and downstream sides of the filter device, and a peripheral frame surrounding and attached to the margin of the pleated filter media, the improvement of a filter media retaining device comprising:

at least one rigid elongated beam connected to the filter frame at the opposite ends of the at least one beam, disposed within a pleat of the filter media and extending longitudinally within that pleat for the entire length of the pleat in which it is disposed, and having a portion which projects outwardly of that pleat; and,



at least one rod extending transversely to and intersecting the at least one beam, the at least one rod being connected to the portion of the at least one beam projecting outwardly of the pleat at its intersection with the at least one beam, the at least one rod being attached to the filter frame at its opposite ends, and the at least one rod being disposed in spaced juxtaposition to the downstream side of the filter media to keep the filter media from distorting in a downstream direction of the filter device.

4,135,901

METHOD OF MANUFACTURING GLASS FOR OPTICAL WAVEGUIDE

Kunio Fujiwara; Gotaro Tanaka, both of Yokohama, and Shiro Kurosaki, Kamakura, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 640,889, Dec. 15, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,893

Claims priority, application Japan, Dec. 18, 1974, 49-145338

Int. Cl.[2] C03B *37/00*; C03C *25/02*

U.S. Cl. 65—2 **6 Claims**

1. The method of manufacturing a glass rod with a radially varying refractive index comprising the steps of respectively directing a plurality of streams of glass forming compounds onto a rotating base with said streams positioned at different adjacent radial positions with respect to the central axis of rotation of the base, said glass forming compound streams having predetermined refractive index glass forming compositions, rotating the base about the axis of rotation, heating and oxidizing said streams at a temperature sufficiently high to form a conversion thereof to glass, and continually depositing said glass on said rotating base while retracting said base away from said streams to thereby axially build up a glass rod deposit having a refractive index which varies radially in accordance with the predetermined composition of each respective radially positioned stream and having an axis common to said axis of rotation.

4,135,902

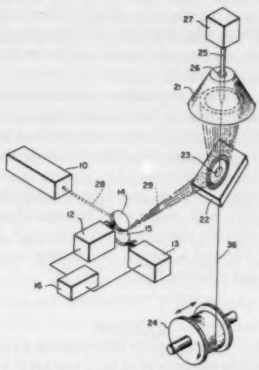
METHOD AND APPARATUS FOR DRAWING OPTICAL FIBERS

Robert C. Oehrle, Beverly, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Mar. 3, 1978, Ser. No. 883,074

Int. Cl.[2] C03B *37/00*

U.S. Cl. 65—2 **14 Claims**



1. A method of drawing a fiber from a preform, comprising the steps of:

reflecting a beam of high energy radiation from a first oscillating mirror onto a second oscillating mirror;

controlling the oscillations of the mirrors to cause a predetermined pattern to be reflected from the second mirror;

directing the patterned beam onto the preform to form a melt zone therein; and

drawing the fiber from the melt zone.

4,135,903

METHOD FOR PRODUCING FIBERS FROM HEAT-SOFTENING MATERIALS

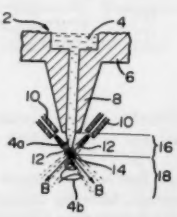
Nobuyoshi Ohsato; Keihachiro Tanaka, and Eiji Mizushima, all of Itami, Japan, assignors to Nippon Sheet Glass Co., Ltd., Japan

Filed Aug. 18, 1976, Ser. No. 715,648

Claims priority, application Japan, Aug. 20, 1975, 50-101618

Int. Cl.[2] C03B *37/06*

U.S. Cl. 65—5 **11 Claims**



1. A method for producing fibers from a glass material, which comprises:

heating the glass material in a melting crucible to form a viscous melt, and continuously causing the melt to flow from said crucible through at least one nozzle provided thereon; and

jetting out at least three substantially straight-line high speed gas streams disposed at intervals around the melt in its peripheral direction, each of said streams having a component in the tangential direction along the cross-section of the melt and a component which gradually approaches the central axial line of the melt toward the flowing direc-

tion of the melt and then gradually departs from the central axial line, toward the melt which has flown out, whereby the melt is rotated about its central axial line and is formed into a substantially conical shape in a first zone which ranges from the flow-initiating part of the melt to the part at which the gas stream most closely approaches the central axial line of the melt, and in a second zone subsequent to the first zone, the melt being allowed to fly in fibrous form from the tip of the conical shape in a vortex form in the flowing direction and outwardly in the radial direction and wherein said straight-line high speed gas streams are inclined at an angle of 20 to 70° to the central axial line of the melt,

the distance between the outlet of the melt-flowing nozzle and the focal point at which the high speed gas stream most closely approaches the central axial line of the melt being 0.2 to 10 times the effective hole diameter of the melt-flowing nozzle,

and said straight-line high speed gas streams being arranged symmetrically with respect to the central axial line of the melt as a rotating symmmetrical axis, and at least two of the angles formed between the central axial lines of the adjoining gas streams being 95 to 135°.

4,135,904

PREMELTING METHOD FOR RAW MATERIALS FOR GLASS AND APPARATUS RELEVANT THERETO

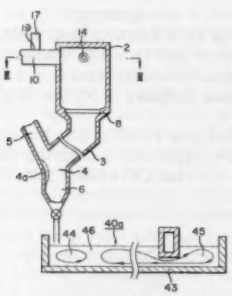
Takeshi Suzuki; Mikio Murao; Susumu Utiyama, all of Kobe; Kyohei Hatanaka, and Hajime Inoue, both of Matsusaka, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Central Glass Co., Ltd., Ube, both of, Japan

Filed Nov. 11, 1977, Ser. No. 850,692

Claims priority, application Japan, Nov. 15, 1976, 51-137532; Nov. 15, 1976, 51-137533; Nov. 15, 1976, 51-137534; Nov. 15, 1976, 51-137535

Int. Cl.[2] C03B *3/00*

U.S. Cl. 65—27 **23 Claims**



1. A method for premelting raw materials for glass and then feeding same to a glass tank furnace, which comprises the steps of:

feeding an atomized fuel into the upper end of an upright combustion chamber, blowing combustion air into the upper end of said combustion chamber so that said air swirls along the inner wall of the combustion chamber and burns the fuel whereby to generate a heated swirling combustion gas atmosphere in said combustion chamber, and feeding said raw materials for glass into the upper end of said combustion chamber whereby said raw materials become melted therein by contact with said heated combustion gas atmosphere and move downwardly toward the lower end of said combustion chamber;

flowing a stream of molten raw materials and combustion gas from the lower end of said combustion chamber downwardly through a downwardly and sidewardly inclined duct;

then separating said combustion gas from said molten raw materials at the lower end of said inclined duct by flowing said combustion gas upwardly through an exhaust gas duct which extends upwardly from said lower end of said inclined duct and by flowing said molten raw materials downwardly through an upright duct which extends downwardly from the lower end to said inclined duct and communicates with the glass tank furnace.

20. An apparatus for premelting the raw materials for glass, which comprises a combustion chamber having a circular horizontal section, air inlet duct means at the upper part of said combustion chamber for feeding air thereinto in a tangential direction, fuel feed means at the uper part of the combustion chamber for feeding fuel into said combustion chamber for combustion therein, means connected to said air inlet duct for feeding raw materials for glass so that said raw materials enter said combustion chamber with the air, a downwardly and sidewardly inclined duct extending from the lower end of said combustion chamber, an upright duct extending downwardly from the lower end of said inclined duct for feeding the premelted raw materials to a glass tank furnace, and an exhaust gas duct extending upwardly from the lower end of said inclined duct for discharging the combustion exhaust gas, said exhaust gas duct being connected to the boundary portion between said inclined duct and said upright duct.

4,135,905

PROCESS FOR GLASS MELTING

William H. Manring, Hamilton, Ohio, assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 711,900, Aug. 5, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,866

Int. Cl.[2] C03B *5/02*

U.S. Cl. 65—136 **4 Claims**

1. In the process of forming glass in an electric furnace wherein glass batch is melted by means of electrical heating elements present in said furnace to produce molten glass and said molten glass is maintained liquid in the bottom of said furnace, and a uniform, coherent blanket of glass batch is maintained above said molten glass to serve as feed and as an insulating blanket by continually feeding glass batch onto the surface of the batch blanket, and wherein molten glass is continually removed from the furnace, the improvement which comprises adding from about 0.1 to about 7% by weight, expressed as BaO, of barium carbonate to the glass batch, to maintain said uniform, coherent blanket of glass batch above said molten glass permeable to gases generated during the continuous melting of part of the glass batch.

4,135,906

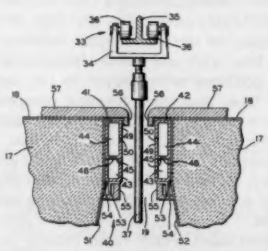
SHEET HEAT TREATING FURNACE

Norman K. Gladieux, Oregon; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 27, 1977, Ser. No. 845,867

Int. Cl.[2] C03B *25/04*

U.S. Cl. 65—348 **4 Claims**



1. In a furnace having a heating chamber for heat treating sheet material moving therethrough and a slot of substantial

elongation in its roof opening into the heating chamber whereby sheet material is suspended in a vertical plane from a support projecting through the slot, and including apparatus for establishing a barrier across the slot for preventing escape of hot gases from the interior of the furnace, said apparatus comprising:

a. a pair of elongated housings, each of said housings being mounted in the slot and attached to the side walls defining the slot so as to extend the length thereof;

b. an intermediate wall disposed within and throughout the length of each said housing separating the interior of each said housing into at least a first elongated chamber and a second elongated chamber;

c. means for supplying pressurized fluid to said first chamber of each said housing;

d. first orifice means extending throughout the length of said intermediate wall for regulating the flow of pressurized fluid from said first chamber to said second chamber in each said housing to create substantially uniform pressure in said fluid throughout the length of said second chamber; and

e. second orifice means for discharging the regulated pressurized fluid from said second chamber of each said housing across the slot towards the opposed one of said pair of housings whereby the opposed flows of pressurized fluid form a uniform barrier resisting escape of hot gases from the heating chamber of the furnace.

4,135,907

PULP TREE BARK TREATMENT

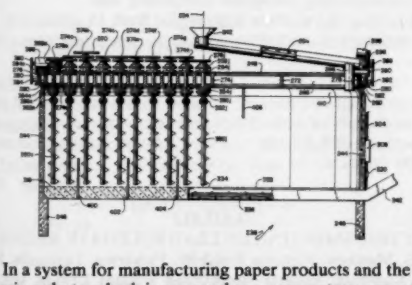
John E. Houser, Marion, and Ralph J. Kramer, Delaware, both of Ohio, assignors to Aerotherm, Inc., Delaware, Ohio

Filed May 17, 1977, Ser. No. 797,610

The portion of the term of this patent subsequent to Jan. 16, 1996, has been disclaimed.

Int. Cl.[2] C05F *11/08, 11/00*

U.S. Cl. 71—9 **24 Claims**



1. In a system for manufacturing paper products and the like wherein pulp tree bark is removed as a preparatory procedure to pulping and wherein a sludge categorized effluent is generated as a waste product, the improvement comprising:

recieving means for receiving said removed bark in an aerobically untreated state;

first means for providing nitrogenous material;

second means for providing an aqueous liquid;

mixing means for receiving, agitating and retaining, for a predetermined interval, said bark, said nitrogenous material and said aqueous liquid to provide a moisture and nitrogen content adjusted substantially biodegradable material;

transfer means for conveying said moisture and nitrogen content adjusted material;

digester means for inducing the aerobic, thermophilic phase decomposition of said biodegradable material including:

a receptacle of generally cylindrical surface configuration having a circular top edge portion, a bottom portion supportable upon a base and dimensioned for retaining a predetermined volume of said material;

means for supplying atmospheric air under pressure;

conduit means connected with said means for supplying air, positioned within said receptacle substantially at the level of said bottom portion, including a plurality of spaced outlets for said pressurized air, arranged in a pattern for effecting an aerobic influence over substantially all of said material deposited within said receptacle by air issuing from said outlets;

diffuser means positioned within said receptacle, having an upward surface for supporting said material above said conduit means and for effecting a diffusion of said air issuing from said outlets;

support means extending diametrically across said receptable and supported upon said receptacle circular top portion and rotatable thereupon about the centrally disposed axis of said cylindrical surface;

input means supported upon and rotatable with said support means for receiving said material from said transfer means and depositing said received material into said receptacle in the vicinity of said cylindrical surface;

agitator means including rotational, auger-type agitators supported by said support means and rotationally moveable about said receptacle, each said agitator extending substantially to the upwardly disposed surface of said diffuser means, said agitators being serially disposed and mutually spaced within two substantially parallel rows each extending from the vicinity of said axis of said cylindrical surface toward said cylindrical surface and of number sufficient to confront substantially the entirety of said material when moved a full revolution about said receptacle, said agitator means and said diffused air effecting a progressive dimunition of the biochemical oxygen demand of said material; and

output means including means defining an orifice positioned at said axis of said cylindrical surface at said upward surface of said diffuser means for removing from said receptacle said material evidencing a substantially low biochemical oxygen demand value within said receptacle and being designated thermophilic phase digested material; and

at least one said auger-type agitator being positioned above at least a portion of said orifice so as to effect an agitation of digested bark located thereabove.

4,135,908

METHOD OF AND APPARATUS FOR AEROBIC DECOMPOSITION OF ORGANIC SOLIDS

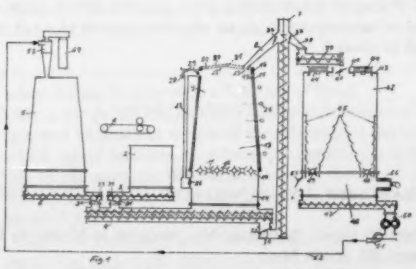
Peter Widmer, Mooswiesstrasse 3, Pfaffhausen, Switzerland (8122)

Filed Jul. 20, 1977, Ser. No. 817,483

Claims priority, application Switzerland, Mar. 8, 1977, 2844/77; Apr. 4, 1977, 4171/77

Int. Cl.[2] C05F *11/08*

U.S. Cl. 71—9 **26 Claims**



1. A method of aerobic decomposition of organic solids, comprising:

mixing the material to be decomposed with a relatively drier material in an amount sufficient to decrease the water

content of the mixture to below a predetermined upper limit;

conveying the mixture to the top of a thermally insulated, upwardly tapering tower reactor, and adding the mixture thereto;

continuously introducing an oxygen containing gas under superatmospheric pressure beneath the tower reactor, thereby causing the gas to continuously pass through the mixture of material in the tower reactor; and

intermittenly, under predetermined temperature-controlled conditions, removing the mixture of material from the bottom of the reactor in layers, conveying the removed material back to the top of the tower reactor, and adding the removed material into the top of the tower reactor to form a covering layer thereon;

wherein said steps of conveying the mixture of material and conveying the removed material to the top of the tower reactor are accomplished by sliding back or rolling back the material, while being conveyed, to shape the material into balls of a substantially spherical shape.

4,135,909

SALTS OF PHOSPHONIC ACIDS

Johann Jung, Limburgerhof; Karl Kiehs, Lampertheim; Bernd Zeeh, Ludwigshafen, and Hans Theobald, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

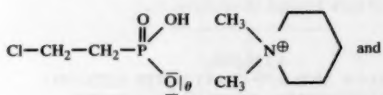
Division of Ser. No. 568,147, Apr. 14, 1975, Pat. No. 4,071,551. This application Dec. 29, 1976, Ser. No. 755,581

Claims priority, application Fed. Rep. of Germany, May 10, 1974, 2422807

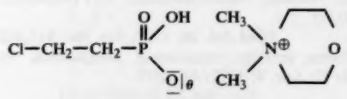
Int. Cl.[2] C07F *9/38;* A01N *9/36*

U.S. Cl. 71—86 **2 Claims**

1. A salt of a phosphonic acid, said salt being selected from the group consisting of



and



2. An agent for inhibiting plant growth, which agent contains, in aqueous solution, an effective amount of a salt as set forth in claim **1**.

4,135,910

OXADIAZOL-3-YL-BENZOATES AS PLANT GROWTH REGULANTS

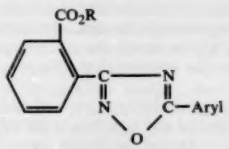
Robert K. Howe, Bridgeton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 12, 1977, Ser. No. 796,249

Int. Cl.[2] A01N *9/22*

U.S. Cl. 71—92 **1 Claim**

1. A method of regulating the growth of desirable plants which comprises applying to said plants an effective amount of a compound having the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl and agriculturally acceptable cations; Aryl is phenyl substituted by one trifluoromethyl.

4,135,911

RHODIUM RECOVERY FROM HYDROFORMYLATION STILL HEEL WITH TRIARYL PHOSPHITE LIGAND

Jean L. Balmat, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 820,046, Jul. 28, 1977. This application May 12, 1978, Ser. No. 905,200

Int. Cl.[2] C22B *13/04;* C01G *55/00*

U.S. Cl. 75—0.5 AB **41 Claims**

1. A process for recovering rhodium that is present in a still heel from the hydroformylation of an unsaturated hydrocarbon, said still heel comprising rhodium triaryl phosphite complex catalyst, triaryl phosphite ligand and high boilers, said process comprising

(a) pretreating the still heel with a mixture of (1) methanol, methyl ethyl ketone, acetone, ethanol, propanol, isopropanol, diethyl ketone, methyl propyl ketone, ethyl propyl ketone or mixtures thereof, (2) at least 5 ml of water per 100 g of still heel, (3) oxygen gas or a precursor thereof and (4) sufficient base to adjust the pH of the still heel after rhodium precipitation to from 2 to 7;

(b) heating the mixture from (a) to a temperature of from 0° to 85° C. until the triaryl phosphite is oxidized to the corresponding phosphate compound; and

(c) heating the mixture from (b) for from 15 minutes to 120 minutes at from 115° to 175° C. to precipitate zero valent rhodium.

9. The process of claim **1** wherein the rhodium precipitate is separated from the mixture, washed with a solvent-acid solution with a pH of from 3 to 4 and oxidized with oxygen at a temperature of from 300° to 900° C. to convert the rhodium to Rh_2O_3.

4,135,912

ELECTRIC SMELTING OF LEAD SULPHATE RESIDUES

Ian G. Matthew, Victoria; Ralph W. Pickering, Tasmania, both of Australia; Takashi Suzuki, and Hisashi Uchida, both of Kagawa, Japan, assignors to Electrolytic Zinc Company of Australia Limited, Australia and Mitsubishi Metal Corporation, Japan

Filed Feb. 24, 1977, Ser. No. 771,429

Claims priority, application Australia, Feb. 27, 1976, PC5043

Int. Cl.[2] C22B *4/04, 13/06*

U.S. Cl. 75—10 R **14 Claims**

1. A process for the recovery of lead and silver values from lead silver residues in which more than 70% of the lead is present as lead sulfates, by treating, without prior sintering, said lead silver residues, said process comprising adding directly, simultaneously and essentially continuously to a Heroult electric furnace:

(a) said lead silver residues;

(b) a carbon-containing reductant; and

(c) fluxes for producing a slag containing FeO, CaO and SiO_2; and

controlling the temperature of the molten slag layer in the Heroult electric furnace to lie within the range of 1000°–1500° C. to produce at least two molten phase separate layers in said furnace, one of said layers being a

slag layer, and another of said layers being a lead silver bullion layer; and

recovering from said furnace a lead silver bullion containing less than 1.1% sulfur and a slag containing no more than 4% of lead.

4,135,913

THERMAL CONCENTRATION OF NON-FERROUS METAL VALUES IN SULFIDE MINERALS

Alexander Illis, Mississauga, and Louis S. Renzoni, Toronto, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation of Ser. No. 399,440, Sep. 21, 1973, abandoned. This application Oct. 10, 1975, Ser. No. 621,343

Claims priority, application Canada, Oct. 27, 1972, 155032

Int. Cl.[2] C22B *23/00*

U.S. Cl. 75—21 **26 Claims**

1. A process for concentrating nickel values contained in nickeliferous ferruginous sulfide minerals having a stoichiometric excess of sulfur over iron with minimization of conversion of sulfide to SO_2, which consists in agglomerating an intimate admixture consisting of a finely-divided beneficiated sulfidic ore-concentrate containing said nickeliferous ferruginous sulfide minerals, finely-divided iron oxide and a reducing reagent, heating the agglomerates to between about 800° C. and 1000° C. in an atmosphere non-oxidizing to metallic iron and having a reducing potential equivalent to a $CO:CO_2$ ratio of between about 1:2 and 2:1 to reduce the iron oxide to metallic iron, to effect thermal diffusion of metal values in the admixture, and to concentrate nickel values in a metallic iron-containing fraction, cooling the heated agglomerates, comminuting the cooled agglomerates and separating the metallic iron-containing fraction from the remainder o the cooled admixture, said remainder of cooled admixture containing most of the sulfur, to provide a nickel concentrate; whereby nickel values are concentrated and the formation of SO_2 is minimized.

4,135,914

PROCESS FOR THE DIRECT REDUCTION OF METALLIC OXIDES

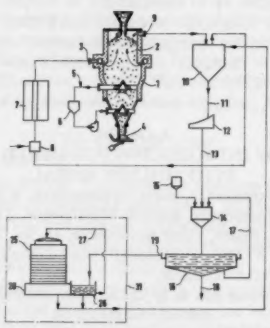
Bogdan Vuletic, Düsseldorf, and Hans-Jürgen Klingelhöfer, Bochum, both of Fed. Rep. of Germany, assignors to Korf Engineering GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 4, 1977, Ser. No. 765,652

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604795

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—34 **1 Claim**



1. In a process for the direct reduction of metal oxide to iron sponge by means of reducing gases containing hydrogen gas in a reduction apparatus in which at least a portion of the water vapor formed in the reduction process and contained in the exhaust gas is separated as condensate by means of cooling water, the improvement comprising combining the condensate with the residual cooling water and reusing said condensate for cooling purposes, the water being cooled partially in an open and partially in a closed system, the two systems being arranged in parallel, the condensate produced being sufficient to compensate for the water evaporated in the open system and removed in the sludge produced by said system as well as for other normal leakage losses of cooling water.

4,135,915

KINETIC ENERGY MONITOR

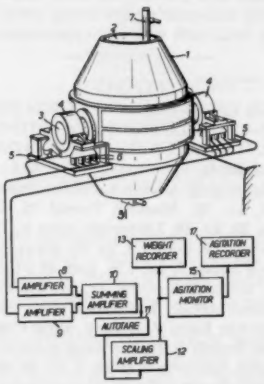
John M. Kennard, Orpington, England, assignor to GEC Mechanical Handling Limited, Melksham, England

Continuation-in-part of Ser. No. 529,297, Dec. 4, 1974, abandoned. This application Sep. 8, 1976, Ser. No. 721,477

Claims priority, application United Kingdom, Dec. 12, 1973, 57567/73

Int. Cl.[2] C21C *5/30*

U.S. Cl. 75—60 **28 Claims**



1. Apparatus for physically or chemically or physically and chemically variably treating a substance in a vessel under conditions that make it diffcult to ascertain a physical change or a chemical change or physical and chemical changes, during which variable treatment the weight of the substance varies as a function of time and at least during a stage of such treatment the substance undergoes a period of change in agitation accompanying a change in at least a physical condition or a chemical condition or physical and chemical conditions of the substance, the onset and termination of said period of changed agitation being indicative of the beginning and the end of said stage of the treatment, said treatment desirably being altered at the beginning and at the end of said stage, said apparatus comprising:

(a) means for monitoring the weight of the substance in the vessel during treatment as a function of time;

(b) means for producing an electricalsignal indicative of the apparent variation in weight of the substance in the vessel which signal includes, as a factor, a variation in weight due to the agitation of the substance in the vessel as it undergoes a physical change or a chemical change or physical and chemical changes;

(c) means for extracting from the apparent weight electrical signal that part of the signal produced by the agitation of the substance in the vessel; and

(d) means for recording the agitation part of the signal as a function of time;

(e) whereby said treatment of said substance may be altered at the beginning and end of said stage at the onset and at the termination of said period of change in agitation.

4,135,916

PROCESS IN THE MANUFACTURE OF STEELS CONTAINING NICKEL

Imrè Tòth, Rambouillet, France, assignor to Societe Metallurgique le Nickel-SLN, Paris, France

Filed Mar. 1, 1977, Ser. No. 773,286
Claims priority, application France, Mar. 5, 1976, 76 06252
Int. Cl.[2] C21C *7/00;* C22C *33/04*
U.S. Cl. 75—60 46 Claims

1. In the process for the manufacture of a steel containing nickel, chromium, silicon, iron, and carbon through the refining of a metal bath containing the aforesaid elements in a converter by the addition of a solid material thereto to control the temperature and thereby obtain a steel having an increased chromium yield as well as a savings in energy, the improvement which comprises continuously adding solid ferro-nickel shot containing carbon and silicon in amounts not exceeding about 3% and about 4%, respectively, and in the form of roughly spherical granules each of which is of a size ranging about from 1 millimeter to 5 centimeters in diameter into the converter at a controlled flow rate to maintain the temperature of the converter at a pre-selected level below the thermal resistance of the converter's refractories, while concurrently contacting the metal bath with an oxygen-containing gas.

4,135,917

PROCESS FOR RECOVERING GALLIUM FROM ALKALI ALUMINATE SOLUTIONS RESULTING FROM TREATMENT OF ALUMINUM-CONTAINING ORES

Khoren A. Badaliants, Sportivnaya ulitsa, 4, kv. 37, Pikalevo Leningradskoi oblasti; Arkady A. Belsky, Komsomolsky prospekt, 48/22, kv. 20, Moscow; Leonid M. Butorin, ulitsa Gavanskaya, 10, kv. 18, Leningrad; Anna E. Danilina, ulitsa Fedora Poletaeva, 8, korpus 5, kv. 63; Alexandr V. Eljutin, 3 Frunzenskaya ulitsa, 7, kv. 176, both of Moscow; Isaak A. Zatulovsky, Sovetskaya ulitsa, 29, kv. 46, Pikalevo Leningradskoi oblasti; Arkady I. Zazubin, ulitsa Vinogradova, 33, kv. 20, Alma-Ata; Raisa V. Ivanova, ulitsa Udaltsova, 14, kv. 181, Moscow; Evgeny A. Isakov, ulitsa Sovetskaya, 28, kv. 16; Ivan M. Kostin, Sportivnaya ulitsa, 4, kv. 16, both of Pikalevo Leningradskoi oblasti; Askar M. Kunaev, ulitsa Vinogradova, 20, kv. 7, Alma-Ata; Teodor G. Milberger, ulitsa Sovetskaya, 27, kv. 40; Petr F. Minin, ulitsa Shkolnaya, 66, kv. 38, both of Pikalevo Leningradskoi oblasti; Nikolai A. Novikov, ulitsa Korolenko, 4/14, kv. 10, Moscow; Tatyana D. Ostapenko, ulitsa Mira, 144, kv. 57, Alma-Ata; Alexandr V. Peredereev, M.Filevskaya ulitsa, 40, kv. 25, Moscow; Garegin A. Peikarov, 6 mikroraion, 34, kv. 82, Pikalevo Leningradskoi oblasti; Gennady A. Romanov, ulitsa Astronomicheskaya, 63, kv. 18, Alma-Ata; Anatolia T. Simanova, ulitsa Sovetskaya, 56, kv. 65, Pikalevo Leningradskoi oblasti; Natalya V. Tishevetskaya, ulitsa Maxima Gorkogo, 60, kv. 4, Alma-Ata; Georgy P. Tkachenko, Slavyansky bulvar, 43, kv. 221, Moscow; Elena L. Shalavina, ulitsa Vinogradova, 33, kv. 20, Alma-Ata; Leonid I. Finkelshtein, ulitsa Chkalova, 45, kv. 2, Achinsk Krasnoyarskogo kraya, and Nikolai S. Shmorgunenko, I Linia, 28, kv. 15, Leningrad, all of U.S.S.R.

Filed Dec. 19, 1977, Ser. No. 862,201
Claims priority, application U.S.S.R., Dec. 22, 1976, 2428006
Int. Cl.[2] C22B *58/00;* C25C *1/24*
U.S. Cl. 75—109 5 Claims

1. A process for recovering gallium from alkali aluminate solutions resulting from the treatment of aluminium-containing ores comprising neutralization of said solutions to a concentration of a caustic alkali of from 0.1 to 10 g/l, evaporation of the neutralized solutions to a concentration of the caustic alkali therein of from 30 to 150 g/l, correction of the evaporated solutions to achieve the ratio of the alkali metal oxide to alumina of above 2, treatment of the corrected solutions with a liquid gallium-alloy containing an element with an oxidizing potential exceeding that of gallium to obtain a concentrate containing more than 90% of gallium by mass, followed by recovering gallium of a higher purity grade from the concentrate by the electrochemical method of cementation or electrolysis method.

4,135,918

ROAST-REDUCTIVE LEACH PROCESS FOR COPPER RECOVERY

Victor A. Ettel; Eric A. P. Devuyst; Ramamritham Sridhar, and Charles E. O'Neill, all of Mississauga, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 2, 1978, Ser. No. 882,610
Claims priority, application Canada, May 13, 1977, 278360
Int. Cl.[2] C22B *15/08*
U.S. Cl. 75—117 7 Claims

1. A process for recovering copper from a particulate sulfide-containing material which contains in addition to said copper at least one other metal selected from the group consisting of iron, nickel and cobalt, comprising roasting said material at a temperature of at least about 750° C. for a period of sufficient duration to provide a substantially sulfur-free calcine, forming a slurry of said calcine with water or an aqueous solution containing at least a sufficient amount of sulfuric acid to supplement any sulfuric acid formed in situ and satisfy the stoichiometry of formation of sulfates of said other metal(s), heating said slurry to a temperature of at least about 110° C. under superatmospheric pressure in the presence of a reducing gas to sulfate said other metal(s) and reduce said copper to elemental form, and separating the product of said pressure-heat treatment into a liquor containing said other metal(s) and a solids residue containing said elemental copper.

4,135,919

ALLOY RESISTANT TO SULFURIC ACID CORROSION

John H. Culling, Kirkwood, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Apr. 25, 1978, Ser. No. 899,826
Int. Cl.[2] C22C *38/42, 38/48*
U.S. Cl. 75—122 4 Claims

1. An air-meltable, castable, workable, weldable alloy, resistant to corrosion in sulfuric acid over a wide range of acid strengths, consisting essentially of between about 26.00 and about 29.13% by weight nickel, between about 23.32 and about 28.28% by weight chromium, between about 0.66 and about 1.88% by weight molybdenum, between about 2.50 and about 3.82% by weight copper, between about 3.59 and about 4.72% by weight manganese, between about 0.15 and about 1.15% by weight niobium, up to about 1% by weight titanium, up to about 1.0% by weight tantalum, up to about 0.010% by weight boron, up to about 0.5% by weight cobalt, up to about 0.60% by weight silicon, up to about 0.08% by weight carbon, up to about 0.6% by weight of a rare earth component selected from the group consisting of cerium, lanthanum and misch metal, up to about 0.15% by weight nitrogen, and between about 33.13 and about 39.49% by weight iron.

4,135,920

METHOD OF INTRODUCING POWDERED MATERIAL INTO MOLTEN METAL

Dzhondo F. Barbakadze, ulitsa Gyadanskaya, 6, kv. 35, Tbilisi; Frants F. Zamechnik, poselok Metallurgov, 116, Volgograd; Vladimir F. Popov, ulitsa Sovetskaya, 11, kv. 23, Volgograd, and Pavel A. Bykov, prospekt imeni Lenina, 179, kv. 83, Volgograd, all of U.S.S.R.

Filed Jul. 6, 1976, Ser. No. 702,409
Int. Cl.[2] C22C *33/08*
U.S. Cl. 75—130 R 7 Claims

1. A method of feeding additive materials into a batch or preset amount of molten metal in a closed vessel by means of a tube and a carrier stream of gas; comprising the steps of: employing an open ended tube which is closed at its immersed end by clogging due to fusion of said end; continuously feeding said carrier stream of gas into said tube while introducing a predetermined amount of said material into said tube so as to be

carried into said molten metal by said carrier gas; and subsequently reducing the pressure of said carrier gas to that of the ferrostatic pressure of the molten metal, so that said molten metal flowing into the open end of said tube freezes solid and plugs said end thereby cutting off the flow of said carrier gas; whereby upon increasing the pressure of said carrier gas in said tube, said end is fused off thus precluding the need to remove said tube from said molten metal and permitting materials if required to be fed again into said molten metal.

4,135,921

PROCESS FOR THE PREPARATION OF RARE-EARTH-SILICON ALLOYS

Edward Morrice, and Jack D. Marchant, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 7, 1978, Ser. No. 884,324

Int. Cl.[2] C21C *7/00*; C22C *33/04, 38/00*

U.S. Cl. 75—134 N **11 Claims**

1. A method for the production of a rare-earth-silicon alloy comprising reacting the components:

(a) one or more rare-earth metal compounds;

(b) an elemental silicon source; and

(c) an elemental aluminum source,

in the presence of calcium oxide.

4,135,922

METAL ARTICLE AND POWDER ALLOY AND METHOD FOR PRODUCING METAL ARTICLE FROM ALUMINUM BASE POWDER ALLOY CONTAINING SILICON AND MANGANESE

Walter S. Cebulak, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 17, 1976, Ser. No. 751,731

Int. Cl.[2] C22C *21/02*

U.S. Cl. 75—143 **22 Claims**

19. An aluminum base powder alloy consisting essentially of the elements 10 to 25% Si, 2 to 5% Mn and substantially free of Mg, Zn and Ni, the balance essentially aluminum and incidental elements and impurities, said alloy being made by allowing said elements in a molten state and then atomizing said alloy at a temperature of 1400 to 1600° F. to produce a powder of said alloy, said powder when hot worked producing an aluminum alloy article characterized by a thermal coefficient of expansion of less than 11.0×10^{-6} inch/inch/° F. and relatively high strength at temperatures of greater than 400° F.

4,135,923

EXTRACTION OF METALS

Joseph G. Day, Holmer Green, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Nov. 23, 1977, Ser. No. 854,427

Claims priority, application United Kingdom, Nov. 23, 1976, 48786/76

Int. Cl.[2] C22C *9/00*

U.S. Cl. 75—153 **4 Claims**

1. A process for the extraction of a precious metal selected from the group consisting of gold, silver, platinum, rhodium, ruthenium, iridium and osmium from a material containing said precious metal, said process including the steps of heating a lead-free mixture consisting essentially of said material; at least one member of the group consisting of (i) cuprous sulphide, (ii) copper sulphate and coke and (iii) copper and iron pyrites; and a flux which is at least one member selected from the group consisting of lime, iron oxide, silica flux, an alkali metal carbonate flux and an alkali metal chloride flux, said mixture being heated to a temperature in the range of 1100°–1300° C. until most of the precious metal forms an alloy with copper and then separating this alloy in the molten state from the remaining material.

4,135,924

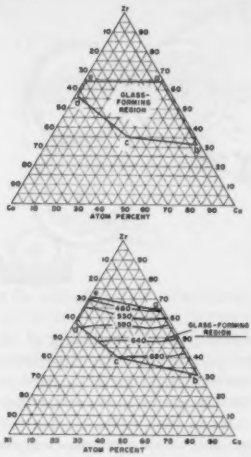
FILAMENTS OF ZIRCONIUM-COPPER GLASSY ALLOYS CONTAINING TRANSITION METAL ELEMENTS

Lee E. Tanner, Summit, and Ranjan Ray, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 9, 1977, Ser. No. 823,055

Int. Cl.[2] C22C *9/00, 16/00, 30/02*

U.S. Cl. 75—159 **3 Claims**



1. Substantially continuous filaments of a substantially glassy zirconium-copper alloy containing an element selected from the group consisting of cobalt and nickel, said alloy consisting essentially of a composition selected from the group consisting of:

(a) zirconium, copper and cobalt which, when plotted on a ternary composition diagram in atom percent Zr, atom percent Cu and atom percent Co, is represented by a polygon having at its corners the points defined by:

(1) 64 Zr - 35 Cu - 1 Co

(2) 31 Zr - 68 Cu - 1 Co

(3) 35 Zr - 35 Cu - 30 Co

(4) 56 Zr - 1 Cu - 43 Co

(5) 64 Zr - 1 Cu - 35 Co; and

(b) zirconium, copper and nickel which, when plotted on a ternary composition diagram in atom percent Zr, atom percent Cu and atom percent Ni, is represented by a polygon having at its corners the points defined by:

(1) 64 Zr - 35 Cu - 1 Ni

(2) 31 Zr - 68 Cu - 1 Ni

(3) 40 Zr - 28 Cu - 32 Ni

(4) 57 Zr - 1 Cu - 42 Ni

(5) 71 Zr - 1 Cu - 28 Ni.

4,135,925

METHODS OF CHANGING COLOR BY IMAGE DISRUPTION

John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 199,683, Nov. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 863,507, Oct. 3, 1969, abandoned. This application Oct. 12, 1973, Ser. No. 406,056

Int. Cl.[2] G03G *13/22*

U.S. Cl. 96—1 PE **3 Claims**

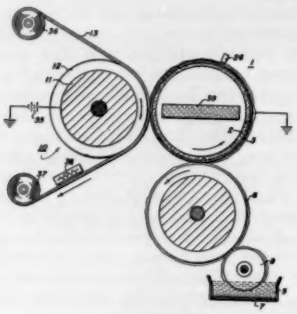
1. A method of selectively changing the color of a fixed developed image produced by a photoelectrophoretic imaging process comprising the steps of:

(a) providing a layer of suspension containing cyan, magenta

and yellow pigments inseparably bound in a polymeric matrix of finely divided particles in an insulating liquid between two substrates;

(b) subjecting the suspension to an applied electric field; and

(c) exposing the layer to electromagnetic radiation whereby an image is formed, the image comprising a composition containing cyan, magenta and yellow pigments the imaging composition exhibiting the resulting color of the differently colored pigments including at least two differently colored pigment particles dispersed and bound in a polymeric matrix, at least one of the particles or the matrix being electrically photosensitive, and being capable of forming images in the resultant color without color or particle seapration which comprises selectively disrupting the matrix by pressure whereby the resultant color is changed to a different color.

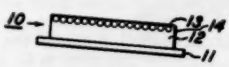


4,135,926

MIGRATION IMAGING PROCESS IN WHICH LATENT IMAGE IS SET

Frank G. Belli, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1973, Ser. No. 349,505
Int. Cl.[2] G03G *13/22*
U.S. Cl. 96—1 PS **17 Claims**



1. An imaging method comprising:

(A) providing an imaging member comprising a migration layer comprising migration material and substantially electrically insulating softenable material, said softenable material capable of having its resistance to migration of migration material decreased sufficiently to allow migration of migration material in depth in said softenable material;

(B) providing said imaging member with a negative charge electrical latent image; and

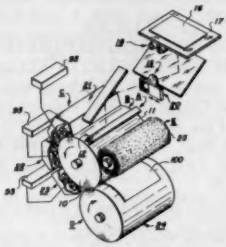
(C) setting said negative electrical latent image by storing said imaging member in the dark for at least about 200 minutes.

4,135,927

MULTICOLOR XEROGRAPHIC PROCESS

Vaidevutis C. Draugelis; William R. Hartman, Jr., both of Rochester, and Michael J. Langdon, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 39,689, May 20, 1970, abandoned. This application May 15, 1975, Ser. No. 577,814
Int. Cl.[2] G03G *13/01*
U.S. Cl. 96—1.2 **4 Claims**



1. The method of reproducing a color copy from a multicolor original; the steps including

separating a plurality of primary colors from the multi-color original to create at least two light images having a greater illumination intensity in those regions containing information relating to the primary color than in regions containing information concerning other colors,

sequentially exposing a uniformly charged photosensitive plate to each of said color separated light images to provide a latent electrostatic image corresponding to each of said light images on said plate with image primary color information recorded at a charge level below a predetermined potential and those regions containing other color information recorded at a charge level above said predetermined potential,

developing each of said color separated electrostatic images selectively with electroscopic developing powder having a colorant capable of absorbing light energy in the spectral domain of the individual image primary color by magnetically bringing said developing powder into developing relationship with the image associated with said primary color while holding other developing powder inoperative;

providing individual preset developing biases for each of said electroscopic developing powders at least equal to the predetermined charge potential for the latent image being developed to suppress developing of image areas below said predetermined charge potential, and

transferring each of the developed images to a single sheet of final support material upon the completion of each developing operation whereby a faithful color reproduction of the multi-color original is produced.

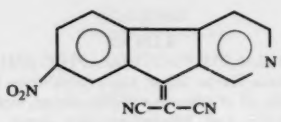
4,135,928

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MEMBER

Mitsuru Hashimoto, Hino; Masafumi Ohta, and Akio Kozima, both of Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1977, Ser. No. 842,485
Claims priority, application Japan, Oct. 23, 1976, 51-127720
Int. Cl.[2] G03G *5/04*
U.S. Cl. 96—1.5 R **5 Claims**

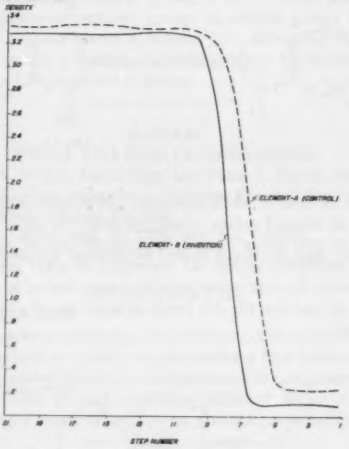
1. An electrophotographic light-sensitive member comprising an electroconductive support, a layer on said electroconductive support, said layer comprising a charge generating substance, a binder and 7-nitro-2-aza-9-fluorenylidene-malonitrile having the following formula:



4,135,929
PHOTOGRAPHIC SULFONAMIDO COMPOUNDS AND ELEMENTS AND PROCESSES USING THEM

Jose M. Fernandez; Michael D. McCreary; Robert E. Ross, all of Rochester, and Jon T. Staples, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 9, 1977, Ser. No. 832,048
Int. Cl.[2] G03C *1/40, 5/54, 1/48, 1/10*
U.S. Cl. 96—29 D 37 Claims



19. A process for producing a photographic image comprising:

(a) imagewise exposing a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye redox releasing compound which is a non-diffusible p-sulfonamidoaniline or p-sulfonamidophenol having attached thereto through the sulfonamido group, a dye or dye precursor which is alkali cleavable upon oxidation, said sulfonamido compound containing, meta to the sulfonamido group, an N,N-disubstituted carbamoyl ballast group containing substituents selected from the group consisting of aliphatic, alicyclic and aromatic groups;

(b) treating the exposed photographic element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of the silver halide emulsion layer as a function of exposure, thereby oxidizing the developing agent;

(c) the oxidized developing agent cross-oxidizing the dye redox releasing compound; and

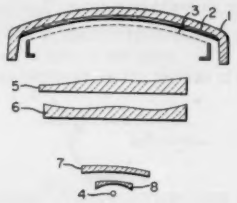
(d) the oxidized dye redox releasing compound then cleaving, thus forming an imagewise distribution of diffusible dye or dye precursor as a function of development of the silver halide emulsion layer and

(e) at least a portion of the imagewise distribution of diffusible dye or dye precursor diffusing out of the layer in which it is coated.

4,135,930
METHOD FOR MANUFACTURING THE PHOSPHOR SCREEN OF COLOR-PICTURE TUBE

Kakuichiro Hosokoshi, Neyagawa; Hiroto Nakamura; Akira Sato, both of Takatsuki, and Masakazu Maeda, Ibaraki, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 555,713, Mar. 6, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 755,952
Claims priority, application Japan, Mar. 7, 1974, 49-26886
Int. Cl.[2] G03C *5/00*
U.S. Cl. 96—36.1 3 Claims



1. A method for manufacturing color-picture tubes characterized in that in the step for exposing picture tubes characterized in that in the step for exposing selectively a photosensitive layer applied on a faceplate by the light beam projecting from a light source through an optical correction system comprising

(a) an optical correction lens system only for correcting the Δs deviation, and

(b) an optical correction lens system for correcting the ΔP deviation consisting of a first optical correction lens and a second optical correction lens,

said first optical correction lens having a rotationally symmetrical shape and being so designed as to attain the correction for the ΔP deviation with equal extent to all of radial direction components only depending upon the deflection angle and by an average amount depending upon all of the radial direction components of the deflection angle and regardless of the individual radial direction of deflection,

said second optical correction lens being so designed as to attain the individual correction for the ΔP deviation depending not only upon the deflection angle but also upon each asymmetrical component of the radial directions of deflection where ΔP is the difference measured axially and ΔS is the difference measured radially between the actual and apparent center of deflection of the picture tube electron.

4,135,931
METHOD OF IMAGE FORMATION

Masakazu Yoneyama; Yoshiharu Fuseya; Norihiko Kato; Senzo Sasaoka, and Shoji Ishiguro, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

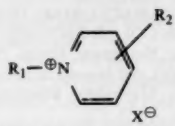
Filed Aug. 26, 1977, Ser. No. 828,113
Claims priority, application Japan, Aug. 27, 1976, 51-102266
Int. Cl.[2] G03C *5/30, 1/06*
U.S. Cl. 96—66.3 15 Claims

1. A method of forming an image which comprises development processing with a lith developer an image-wise exposed silver halide photosensitive element comprising

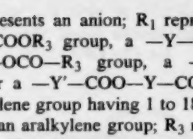
(i) a silver halide photographic emulsion layer; and

(ii) a layer adjacent said silver halide photographic emulsion layer,

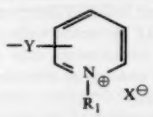
at least one compound represented by the following general formula (I) being present in said layer i) and/or said layer ii):


(I)

wherein $X^{\ominus}$ represents an anion; R_1 represents a —Y—R_3 group, a —Y—$COOR_3$ group, a —Y—$OCOR_3$ group, a —Y'—COO—Y—OCO—R_3 group, a —Y'—OCO—Y—$COOR_3$ group or a —Y'—COO—Y—COO—R_3 group; Y represents an alkylene group having 1 to 18 carbon atoms, an arylene group or an aralkylene group; R_3 represents an alkyl group having 1 to 18 carbon atoms, an aryl group, an aralkyl group,



sents an alkyl group having 1 to 18 carbon atoms, an aryl group or an aralkyl group; R_2 represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 12 carbon atoms, an aryl group having 6 to 12 carbon atoms, an aralkyl group having 7 to 12 carbon atoms, an oxycarbonyl group of the formula —$COOR_5$ wherein R_5 represents an alkyl group having 1 to 18 carbon atoms or an aryl group, an acyloxy group having 1 to 18 carbon atoms, an alkoxy group having 1 to 18 carbon atoms, an amino group, a substituted amino group, an acylamino group, a sulfonamido group, a carbamoyl group, a



group or R_1; Y' is an alkylene group having 1 to 12 carbon atoms, an arylene group, an aralkylene group or a single bond; with the proviso that R_1 or R_2 contains at least one ester group.

4,135,932

PROCESS FOR PREPARATION OF PHOTOGRAPHIC FILM INVOLVING CORONA TREATMENT OF POLYSTYRENE CONTAINING SUBBING LAYERS AND PRODUCT

David R. Mann, Colchester, England, assignor to Bexford Limited, London, England

Filed Sep. 16, 1976, Ser. No. 723,900

Claims priority, application United Kingdom, Sep. 26, 1975, 39569/75

Int. Cl.[2] G03C *1/78*

U.S. Cl. 96—87 R **15 Claims**

1. A process for the production of a light sensitive photographic film, which comprises coating the surface of a self-supporting plastics film with a subbing composition consisting essentially of an aqueous dispersion or a solution in an organic solvent of an essentially water-insoluble homopolymer and/or copolymer comprising styrene and/or a styrene derivative, the styrene and/or a styrene derivative being the major single monomeric constituent of the copolymer, subjecting the surface of the applied subbing layer to a corona discharge modifying treatment and applying a light-sensitive photographic emulsion layer directly to the surface of the treated polymeric subbing layer.

4,135,933

SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato; Atsuo Iwamoto, and Jun Hayashi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 699,008, Jun. 21, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,449

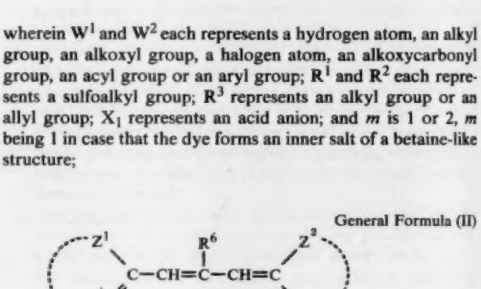
Claims priority, application Japan, Jun. 20, 1975, 50/76163

Int. Cl.[2] G03C *1/40, 1/14*

U.S. Cl. 96—100 R **10 Claims**

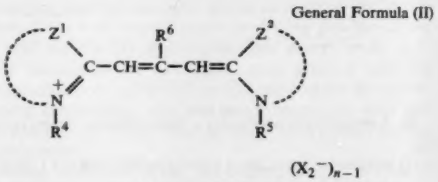
1. A supersensitized silver halide photographic emulsion containing a cyan coupler and, in combination, one of the sensitizing dyes represented by the following general formula (I) and at least one of the sensitizing dyes represented by the general formula (II):

General Formula (I)



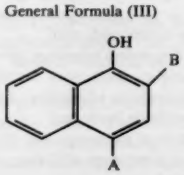
wherein W^1 and W^2 each represents a hydrogen atom, an alkyl group, an alkoxyl group, a halogen atom, an alkoxycarbonyl group, an acyl group or an aryl group; R^1 and R^2 each represents a sulfoalkyl group; R^3 represents an alkyl group or an allyl group; X_1 represents an acid anion; and m is 1 or 2, m being 1 in case that the dye forms an inner salt of a betaine-like structure;

General Formula (II)

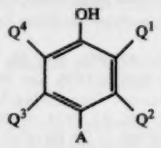


wherein Z^1 and Z^2 each represents an atomic group required for forming a benzothiazole nucleus, a benzoselenazole nucleus, a β-naphthothiazole nucleus or a β-naphthoselenazole nucleus; R^4 and R^5 each represents an aliphatic group and at least one of R^4 and R^5 represents a carboxylakyl group or a sulfoalkyl group; R^6 represents an alkyl group, an aryl group, a thienyl group or a furyl group; X_2 represents an acid anion; and n is 1 or 2, n being 1 in the case that the dye forms an inner salt of a betaine-like structure, wherein said cyan coupler is a cyan coupler represented by the general formula (III) or (IV):

General Formula (III)



-continued
General Formula (IV)



wherein B represents a carbamyl group, a sulfamyl group, an alkoxycarbonyl group or an aryloxycarbonyl group; Q^1 represents an alkyl group, an aryl group, an amino group, a carbonamido group, a sulfonamido group, a sulfamyl group or a carbamyl group; Q^2, Q^3 and Q^4 each represents the groups as defined for Qand further a halogen atom or an alkoxy group; and A represents a hydrogen atom or a group releasable at color development selected from the class consisting of a halogen atom, an indazolyl group, a cyclic imido group, an acyloxy group, an aryloxy group, an alkoxy group, a sulfo group, an arylazo group, a heterocyclic azo group, an arylmonothio group, a heterocyclic thio group, a 1-benzotriazolyl group or a 1-benzodiazolyl group.

4,135,934

METAL COATING COMPOSITIONS

John E. O. Mayne, Cambridge, and Peter J. Heyes, Barnsley, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 16, 1976, Ser. No. 714,397

Claims priority, application United Kingdom, Aug. 29, 1975, 35718/75

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14.36 **11 Claims**

1. In a protective coating composition which protects metal surfaces against corrosion and comprises a film forming vehicle and corrosion inhibitor, the improvement comprising magnesium azelate as said corrosion inhibitor in an effective amount and a minor amount of an alkaline earth metal oxide.

4,135,935

SINTERED COMPOSITE MATERIAL, A PROCESS OF MAKING SAME, AND A METHOD OF USING SAME

Emanuel Pfeil, Marburg, and Heinz Broemer, Hermannstein, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation of Ser. No. 506,610, Sep. 16, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 764,205

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1973, 2346739; Feb. 4, 1974, 2346739; Jul. 18, 1974, 2434979

Int. Cl.² C08K *3/32, 3/40;* **C09K** *3/00*

U.S. Cl. 106—35 **2 Claims**

1. A process for the production of a composite therapeutically useful as a prosthetic material for replacing bones and teeth of humans and animals, said process comprising the steps of:

(a) comminuting a mixture of about 20 parts fluorapatite $Ca_5[F(PO_4)_3]$ prepared by precipitation and about 34 parts glass composition consisting essentially in weight percent of:

between about 20% and about 60% of silicon oxide, SiO_2,

between about 5% and about 40% of phosphorus pentoxide, P_2O_5,

between about 2.7% and about 20% of sodium oxide, Na_2O,

between about 0.4% and about 20% of potassium oxide, K_2O,

between about 2.9% and about 30% of magnesium oxide, MgO,

and between about 5% and 40% of calcium oxide, CaO,

(b) classifying the ground mixture by means of a screen into two fractions of different particle size;

(c) finely comminuting the fraction of smaller particle size to about 30 μm;

(d) compressing and molding the finely comminuted mixture into a shaped body at a pressure of about 300 atmospheres while simultaneously subjecting the mixture to a heat treatment of about 100° C for a period of about 20 minutes; and

(e) sintering the compressed and molded shaped body at atmospheric pressure and at a temperature of about 670° C for a period of time of about 100 minutes whereby said glass composition is melted and said composite produced is characterized by discrete crystallites of said fluorapatite dispersed in a matrix of said glass.

2. The product produced by the process of claim 1.

4,135,936

GLASS-CERAMIC COMPOSITION FOR HERMETIC SEALS

Clifford P. Ballard, Jr., Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1978, Ser. No. 916,398

Int. Cl.² C03C *3/22, 3/04, 3/30*

U.S. Cl. 106—39.6 **3 Claims**

1. A glass-ceramic of high fracture strength for sealing to chromium bearing iron or nickel base alloys, comprising from about 55 to about 65 weight percent silicon dioxide, from about 0 to about 5 weight percent aluminum oxide, from about 6 to about 11 weight percent lithium oxide, from about 25 to about 32 weight percent barium oxide, from about 0.5 to about 1.0 weight percent cobalt oxide, and from about 1.5 to about 3.5 weight percent phosphorous pentoxide.

4,135,937

HIGH DENSITY HOT PRESSED THERMAL SHOCK RESISTANT SILICON CARBIDE

Yorihiro Murata, North Tonawanda; John A. Coppola, Lewiston, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,140

Int. Cl.² C04B *35/56*

U.S. Cl. 106—44 **28 Claims**

1. A dense thermal shock resistant silicon carbide ceramic body which comprises a hot pressed composition comprising silicon carbide, from about 0.2 to about 2.0 weight percent of aluminum diboride and from about 150 to about 500 percent of carbon by weight of aluminum diboride.

4,135,938

HIGH DENSITY THERMAL SHOCK RESISTANT SINTERED SILICON CARBIDE

Yorihiro Murata, North Tonawanda; John A. Coppola, Lewiston, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,356

Int. Cl.² C04B *35/56*

U.S. Cl. 106—44 **25 Claims**

1. A dense thermal shock resistant silicon carbide ceramic body which comprises a pressureless sintered composition comprising silicon carbide, and from about 0.3 to about 3 weight percent of aluminum diboride.

4,135,939

REFRACTORY ARTICLE AND METHOD OF MAKING THE SAME

Patsie C. Campana, 2614 Sherwood Dr., Lorain, Ohio 44053

Filed Dec. 8, 1976, Ser. No. 748,451
Int. Cl.[2] C04B 35/10, 35/14
U.S. Cl. 106—68 9 Claims

1. An unfired refractory article comprising from about 50 to about 70 weight percent fine silica sand particles, said fine silica sand particles having an average particle size ranging from about 0.06 to about 0.10 mm.; from about 10 to about 30 weight percent coarse silica sand particles, said coarse silica sand particles having a maximum particle size of about 3.0 mm.; and from about 15 to about 30 weight percent of an alumina containing clay binder, with the total content of alumina in said unfired article ranging from about 6.0 to about 9.0 weight percent.

4,135,940

LIGHTWEIGHT MATERIAL COMPRISING PORTLAND CEMENT, LIME, SAND, A COLLOID AND AN AIR ENTRAINING AGENT

Raymond Peltier, 11 Square Jasmin, Paris, France (75016)

Filed Dec. 13, 1977, Ser. No. 860,174
Claims priority, application France, Dec. 17, 1976, 76 38093
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—88 14 Claims

1. A lightweight concrete material comprising Portland cement, slaked or hydraulic lime, sand, a colloid and an air entraining compound obtained by vigorous mixing of the components taking up high proportions of air to obtain a controlled and predetermined density, wherein said material contains an equal or greater proportion of lime than Portland cement, said material having been subjected to carbonation by exposure to an atmosphere containing a high content of carbon dioxide.

4,135,941

PROCESS FOR THE PRODUCTION OF PORTLAND TYPE CEMENT CLINKER

Jan P. Skalny, and Waldemar A. Klemm, both of Ellicott City, Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 25, 1977, Ser. No. 790,551
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—100 9 Claims

1. In the process for producing portland cement clinker wherein argillaceous and calcareous type materials are ground and blended to form a generally homogeneous mixture and subsequently burned in a kiln at a temperature in the range of about 1200° C. to about 1500° C. to form cement clinker, the improvement comprising incorporating into said mixture a fluorine containing mineral acid selected from the group consisting of fluosilicic acid, fluotitanic acid, fluoboric acid, and fluophosphoric acid as a fluxing and mineralizing agent in an amount of up to 3.0% by weight based upon the weight of the dry solids in said mixture.

4,135,942

KERATIN MEMBRANE

Masayoshi Kikkawa, Isehara, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jul. 11, 1977, Ser. No. 814,844
Claims priority, application Japan, Jul. 12, 1976, 51/82031
Int. Cl.[2] C08L 89/06
U.S. Cl. 106—155 5 Claims

1. Keratin membrane containing aliphatic polyvalent alcohol in an amount of from 1 to 15 gm. based on one (1) gram of dry keratin.

4,135,943

NOVEL SELECTIVE ADSORBENTS

Masataka Morishita; Mitsuru Fukushima, and Yoshihito Inaba, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Japan

Continuation of Ser. No. 475,174, May 31, 1974, abandoned.
This application Apr. 5, 1976, Ser. No. 673,522
Claims priority, application Japan, May 31, 1975, 50-61468; Jun. 13, 1973, 48-67053; Jan. 22, 1974, 49-9855
Int. Cl.[2] C08L 5/00; B01J 31/06
U.S. Cl. 106—209 30 Claims

1. A selective adsorbent shaped in the form of spherical particles having sizes of 30 to 1200μ, each particle containing fine powders of an adsorbent with particle sizes of 0.5 to 50μ dispersed in a matrix of a crosslinked polymer, said selective adsorbent being produced by a process comprising dispersing an adsorbent in the form of a fine powder in a composition for forming a crosslinked polymer containing a mixture selected from the group consisting of (a) a mixture of hydroxyl group-containing polymeric substance and a polyfunctional crosslinking agent reactive with hydroxyl groups and (b) a monomeric mixture of an ethylenically unsaturated monomer and a polyfunctional crosslinking monomer for said ethylenically unsaturated monomer to form a dispersion, dispersing said dispersion in the form of fine droplets in a vehicle, and effecting crosslinking to convert the fine droplets into spherical particles each comprising a crosslinked polymer matrix with said fine particles of the adsorbent dispersed therein.

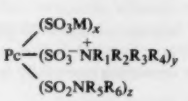
4,135,944

PIGMENT COMPOSITION

Ian R. Wheeler, Houston, Scotland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 20, 1977, Ser. No. 835,072
Claims priority, application United Kingdom, Sep. 21, 1976, 38983/76; Feb. 25, 1977, 8079/77
Int. Cl.[2] C08K 5/34
U.S. Cl. 106—288 Q 12 Claims

1. A single stage process for the production of copper phthalocyanine pigment compositions having x-ray diffraction spectra corresponding to the form of pure, or substantially pure ϵ-crystal modification of copper phthalocyanine comprising reacting, at an elevated temperature and in an organic solvent, an organic compound capable of forming the phthalocyanine ring system, a copper compound capable of providing the copper atom of the phthalocyanine molecule, a reaction catalyst, and a nitrogen source, in the presence of, as crystal form modifier, a compound of the formula



I

wherein Pc represents a copper residue, R_1, R_2, R_3, R_4 and R_5 and R_6 are the same or different and each is a hydrogen atom, an alkyl group, a cycloalkyl group, an aryl, aralkyl, alkaryl, cycloalkaryl or dehydroabietyl group, the alkyl and cyclcalkyl groups being optionally unsaturated and/or interrupted by heteroatoms, M represents hydrogen or an alkali metal atom and x, y and z are each in the range of from 0 to 4 with the proviso that the sum of x, y and z is within the range of from 1 to 4.

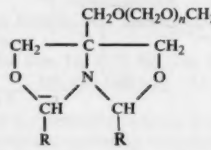
4,135,945
PIGMENT DISPERSIONS CONTAINING POLYOXYMETHYLENEOXAZOLIDINE BIOCIDES

Frederick J. Buono, Robbinsville, and William B. Woods, Lebanon, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Aug. 22, 1977, Ser. No. 826,590
Int. Cl.[2] C08L *79/04*
U.S. Cl. 106—308 N **6 Claims**

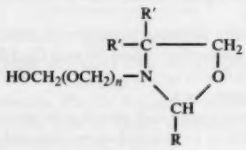
1. An aqueous pigment dispersion having improved resistance to attack by bacteria and fungi that consists of (1) 20% to 75% by weight of a pigment component, (2) 0.2% to 15% by weight of a surfactant component, (3) 20% to 75% by weight of water, and (4) 0.02% to 2% by weight of a biocidal component that comprises a polyoxymethyleneoxazolidine selected from the group consisting of

(a) compounds having the structural formula



wherein each R represents hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, halophenyl, or $-(CH_2O)_mCH_2OH$; m represents a number in the range of 0 to 2; and n represents a number in the range of 1 to 4;

(b) compounds having the structural formula



wherein each R′ represents alkyl of 1 to 6 carbon atoms or $-CH_2OH$ and R and n have the aforementioned significance; and

(c) mixtures thereof.

4,135,946
PROCESS AND APPARATUS FOR ENHANCING GROWTH OF PRECIPITABLES IN A CHEMICAL SOLUTION

John A. Casey, 1755 Beach St., San Francisco, Calif. 94123, and Ismael E. Rojas, 17 Calle A 7-09 Zona 10, Guatemala, Guatemala

Filed Feb. 3, 1978, Ser. No. 874,733
Int. Cl.[2] C13D *3/02*
U.S. Cl. 127—11 **25 Claims**

1. A method for treating in a treatment tower a chemical solution to enhance the growth and coagulation of undesirable precipitables which comprises the steps of:

introducing said solution generally at the upper end of said tower;

directing the flow of said solution so that said solution flows downwardly as a relatively thin film through a generally extended path;

introducing a first chemical treating agent into said downwardly flowing film of solution;

introducing a second chemical treating agent into said solution after said solution has completed its extended downward path;

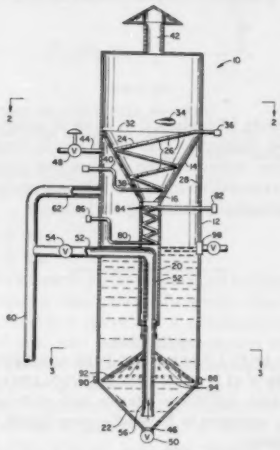
diverting the flow of the treated solution downwardly over a diversion structure within the lower portion of said tower and outwardly toward the wall of said tower whereby turbulence of the flowing solution is prevented and whereby the precipitables generally coagulate as they pass over said structure;

removing said solution from said tower so as to prevent the settling of the coagulated particles within the tower; and

adjusting the rate at which said solution is removed from the tower so as to vary the residence time of the solution within said tower.

16. A treating tower for the chemical treatment of a solution to induce growth and coagulation of undesirable precipitables which comprises:

a conical funnel in an upper portion of said tower opening into a vertical exit conduit;



spiral tubular feeding means, perforated along its length, nesting in said conical funnel and having inlet and outlet conduit means for receiving and discharging a first treating agent;

means for introducing a second treating agent to the solution after it has exited said funnel;

means proximate the lower end of said vertical exit conduit for gently diverting the flow of the treated solution outwardly toward the outer wall of said tower whereby the precipitables grow in size as they pass over the surface of said diverting means; and

means for removing the solution and the coagulated precipitables from a lower portion of said tower whereby breakup of the coagulated precipitables is prevented.

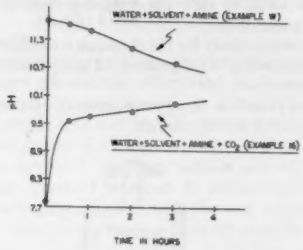
4,135,947
METHOD OF CLEANING SURFACES WITH CO_2-NEUTRALIZED AMINE COMPOSITIONS

Donald R. Rink, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 22, 1977, Ser. No. 789,925
Int. Cl.[2] B08B *3/08, 3/10*
U.S. Cl. 134—4 **19 Claims**

10. Method of removing or softening an unwanted organic coating bonded to a surface, comprising the steps of applying to said coating an aqueous composition containing from about 1 to about 20 weight percent of one or more water-soluble secondary or primary organic amines based on the total weight of the composition said amine being neutralized with CO_2 in the composition in an amount sufficient to cause said composition to have a pH of 10 or less, said composition being capable of releasing said amine and carbon dioxide into said composition when said composition is subjected to conditions wherein the partial pressure of carbon dioxide acting on the composition is less than the partial pressure of carbon dioxide in said composition at the temperature at which the composition is used to clean said surface, said amine having a boiling point in

excess of the temperature at which the composition is used for cleaning said surface and being capable, alone or in conjunction with a water-soluble organic solvent, of loosening or softening said coating on said surface, said composition additionally containing from about 0 to about 50 weight percent of a water-soluble organic solvent based on the total weight of the composition; subjecting the composition applied to said coating to said conditions to soften or loosen said coating; and thereafter mechanically removing said coating.



4,135,948

METHOD AND APPARATUS FOR SCRAPING THE BOTTOM WALL OF A COKE OVEN CHAMBER

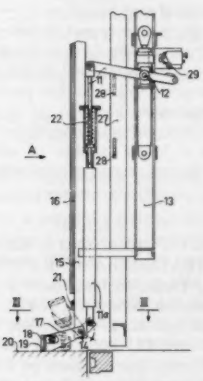
Gottfried Mertens, and Walter Stanke, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,526

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657227

Int. Cl.[2] B08B *7/00*; C10B *43/04*

U.S. Cl. 134—6 **10 Claims**



10. A method of scraping the bottom wall of a coke oven chamber adjacent the chamber opening to remove deposits which prevent sealing insertion of the chamber door into the opening, comprising the steps of inserting through the opening and axially into the chamber an arrangement having an upwardly inclined scraper tool facing outwardly of the opening subsequent to the insertion and which is provided with a substantially horizontal scraping edge; changing the inclination of the tool until the scraping edge engages the bottom wall of the chamber; and retracting the arrangement through the opening axially of the chamber so that the scraping edge scrapes over the bottom wall and removes deposits from the same.

4,135,949

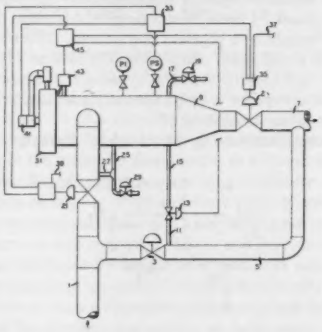
SAFETY INTERLOCK FOR PIPELINE PIG LAUNCHER AND RECEIVER

Herbert E. Reese, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1976, Ser. No. 687,477

Int. Cl.[2] B08B *7/04*

U.S. Cl. 134—18 **9 Claims**



1. A method for effecting a safety interlock for a system comprising a vessel with a removable closure and interconnecting operating fluid flow lines for pressuring said vessel with fluid said lines containing automatically controlled valves to control fluid flow, said method comprising:

(a) generating a signal indicative of an operating condition of said vessel,

(b) automatically initiating operation to effect a closed position of the controlled valves on said fluid flow lines when the signal indicates said operating condition outside predetermined limits, and

(c) fixedly maintaining said closed position until the operating condition is re-established within said predetermined limits.

4,135,950

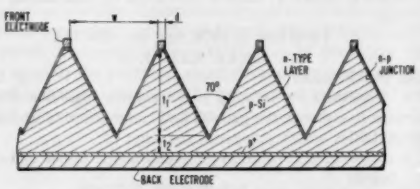
RADIATION HARDENED SOLAR CELL

Edmund S. Rittner, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 615,633, Sep. 22, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,630

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 SJ **6 Claims**



1. A method of using a radiation hardened solar cell in an extraterrestrial application comprising the steps of forming a plurality of V-grooves on the front surface of a semiconductor substrate of a first conductivity type, forming a thin layer of a second, opposite conductivity type layer thereupon to form a junction having the same topography as the front surface of the solar cell, highly doping the planar back surface of the solar cell to satisfy the conditions of $s << D/L$, where s is the surface recombination velocity at the back surface, and D and L are the diffusion coefficient and the diffusion length, respectively, of minor carriers in the substrate, selecting the thickness

of the solar cell optimized power output throughout a given design lifetime of said extraterrestrial application when said cell is subjected to extraterrestrial radiation such that the thickness of said cell measured from the planar back surface to the peaks of the V-grooves is approximately equal to the diffusion length L of minority carriers at the beginning of the design lifetime and the thickness of the solar cell measured from the planar back surface to the valleys of the V-grooves is approximately equal to the diffusion length L of minority carriers at the end of the design lifetime, and exposing said cell to extraterrestrial radiation.

4,135,951

ANNEALING METHOD TO INCREASE MINORITY CARRIER LIFE-TIME FOR NEUTRON TRANSMUTATION DOPED SEMICONDUCTOR MATERIALS

Bobbie B. Stone, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 13, 1977, Ser. No. 806,137
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 **10 Claims**

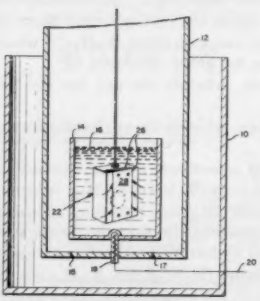
1. A method for restoring neutron-doped semiconductor material resistivity and increasing the minority carrier lifetime of said material through annealing, comprising: heating the material to an annealing temperature of around 600° C. or more but below the material melting temperature for a period of one-fourth hour to five hours or more; and cooling the heated material from the annealing temperature to ambient temperature of below about 300° C. at a cooling rate of from ¼° C. to about 4° C. per minute.

4,135,952

PROCESS FOR ANNEALING SEMICONDUCTOR MATERIALS

C. Lawrence Anderson, Pacific Palisades, and Howard L. Dunlap, Grenada Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 3, 1977, Ser. No. 838,612
Int. Cl.[2] H01L *21/477*
U.S. Cl. 148—1.5 **2 Claims**



1. A process for annealing semiconductor materials and simultaneously preventing their crystal dissociation and decomposition comprising:

(a) enclosing a semiconductor crystal in a liquid-tight and gas-porous container;

(b) immersing said container in a solution containing the elemental component or components of said semiconductor crystal; and

(c) maintaining said solution at a predetermined elevated anneal temperature, whereby said semiconductor crystal is brought into intimate contact with equilibriating elemental gases from said solution while being completely isolated from any direct physical contact with the source of said gases.

4,135,953

PERMANENT MAGNET AND METHOD OF MAKING IT

Hartmut Nagel, Wettingen, and Roger Perkins, Oberrohrdorf, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation-in-part of Ser. No. 722,121, Sep. 10, 1976, Pat. No. 4,081,297. This application Aug. 30, 1977, Ser. No. 829,205
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.[2] H01F *1/02*
U.S. Cl. 148—103 **10 Claims**

1. A rare earth permanent magent comprising an alloy consisting of:

$$RE_2(Co_{1-x-y}Fe_xTM_y)_{17+z}$$

wherein:

RE is at least one rare earth element;

TM is at least one transition element selected from the group consisting of chromium, manganese, titanium, tungsten and molybdenum;

$-2 \leqq z \leqq 1$;

$0.5 < (1-x-y) < 1$

$0.05 \leqq x \leqq 0.4$

$0.01 \leqq y \leqq 0.2$

wherein said rare earth permanent magnet is further characterized by possessing high values of coercive field strength, an ideal demagnetization curve and a remanence of more than 9KG and wherein said rare earth permanent magnet is prepared by the process which comprises mixing together a starting alloy of the composition $RE_2(Co_{1-x-y}Fe_xTM_y)_{17+z}$ and 8 to 14 wt.% of a samarium-rich sinter additive compound composed of 50–60 wt.% samarium and 40–50 wt.% of an alloy $Co_{1-x-y}Fe_xTM_y$ wherein both said starting alloy and said sinter additive are each in powder form of average grain size 2.0 to 10 μm; magnetically aligning the mix; compressing it to a greenling; sintering it to form a magnet; and subjecting said magnet to a heat treatment to 400° C.–600° C.

4,135,954

METHOD FOR FABRICATING SELF-ALIGNED SEMICONDUCTOR DEVICES UTILIZING SELECTIVELY ETCHABLE MASKING LAYERS

Augustine W. Chang, Wappingers Falls, and Arun K. Gaind, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1977, Ser. No. 814,801
Int. Cl.[2] H01L *21/22, 21/316*
U.S. Cl. 148—187 **16 Claims**

1. A method of manufacturing integrated circuits comprising the steps of:

forming, atop a semiconductor substrate, superimposed first, second and third layers of masking material which are selectively etchable with respect to each other;

etching a predetermined set of openings in said first layer while not affecting said second layer;

etching a first sub-set of openings within said predetermined set of openings through at least said second masking layer while protecting the other openings in said set, said first masking layer functioning as a mask for said second masking layer;

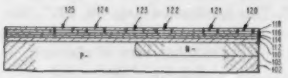
forming first regions in said substrate through said first sub-set of openings;

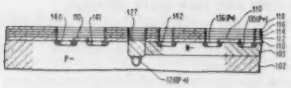
etching a second sub-set of openings within said predetermined set of openings through at least said second layer while protecting the other openings in said set;

forming second regions in said substrate through said second sub-set of openings;

etching a third sub-set of openings within said predeter-

mined set of openings through at least said second layer while protecting the other openings in said set; and





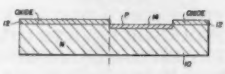
forming third regions in said substrate through said third sub-set of openings.

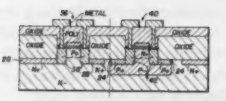
4,135,955

PROCESS FOR FABRICATING HIGH VOLTAGE CMOS WITH SELF-ALIGNED GUARD RINGS UTILIZING SELECTIVE DIFFUSION AND LOCAL OXIDATION

John T. Gasner, Melbourne, and Anthony L. Rivoli, Palm Bay, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Sep. 21, 1977, Ser. No. 835,263
Int. Cl.[2] H01L *21/22, 29/78*
U.S. Cl. 148—187 **15 Claims**





1. A process for preparing a substrate of a first conductivity type for the fabrication of CMOS devices comprising:

forming a first mask layer on said substrate to define a first area for a first MOS device and guard ring;

doping said first area with an impurity of a second conductivity type to form a well region;

forming a second mask layer on said first mask layer and said well region to define a second area for a second MOS device and a third area for said first MOS device, respectively;

doping said well region between said first and second mask layers with an impurity of said second conductivity type to form a guard ring of said second conductivity type;

forming a third mask layer over said first area;

doping the area between said third mask layer and said second mask layer with an impurity of said first conductivity type to form a guard ring of said first conductivity type;

removing said third mask layer; and

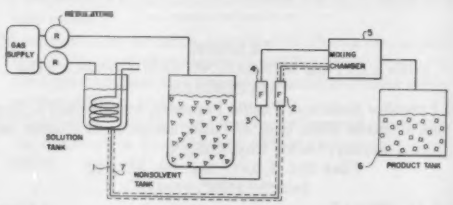
increasing the thickness of said first mask layer in areas not covered by said second mask layer.

4,135,956

COPRECIPITATED PYROTECHNIC COMPOSITION PROCESSES AND RESULTANT PRODUCTS

Terrence P. Goddard, Aptos, and Donald N. Thatcher, Hollister, both of Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Continuation-in-part of Ser. No. 585,216, Jun. 6, 1975, abandoned. This application Jun. 10, 1976, Ser. No. 694,626
Int. Cl.[2] C06B *31/00, 43/00*
U.S. Cl. 149—22 **26 Claims**



1. A process for preparing a coprecipitated composition of a solid oxidizing agent and certain simple decahydrodecaborate salts, having the common anion $B_{10}H_{10}^{-2}$ wherein the cation is selected from the group consisting of:

A. ammonium, wherein the salt has the formula $(NH_4)_2 B_{10}H_{10}$;

B. hydrazinium, wherein the salt has the formula $(NH_2NH_3) B_{10}H_{10}$;

C. substituted ammonium cations, wherein the salt has the general formula $(R_3NH)_2 B_{10}H_{10}$, wherein further R is selected from the group consisting of hydrogen and alkyl radicals containing less than six carbon atoms;

D. substituted hydrazinium cations, wherein the salt has the general formula $(R_2NNR_2H)_2 B_{10}H_{10}$ wherein further R is selected from the group consisting of hydrogen and alkyl radicals containing less than six carbon atoms, comprising the steps of:

i. dissolving both the decahydrodecaborate (−2) salt and the oxidizing agent in a mutually soluble solvent, at a temperature sufficiently high to maintain said salt and said oxidizing agent in solution;

ii. forming a pressurized stream of said solution and bringing said solution stream together with a pressurized stream of a miscible nonsolvent, under conditions of extreme turbulence within a mixing chamber, to effect a substantially complete coprecipitation;

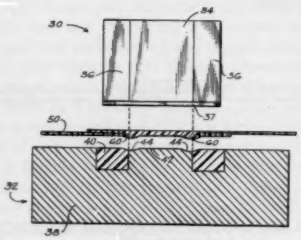
iii. recovering the coprecipitated product by filtering the effluent from said mixing chamber, and washing said product with an inert and nonsolvent fluid;

iv. drying the product to remove all remaining liquid.

4,135,957
METHOD FOR SEALING PLASTIC SHEETS

Ronald L. Voller, Buffalo Grove, Ill., assignor to Vin-Tex Sealers Inc., Itasca, Ill.

Continuation of Ser. No. 620,639, Oct. 8, 1975, abandoned. This application Jan. 3, 1978, Ser. No. 866,243
Int. Cl.[2] B29C *27/04;* B29D *23/10*
U.S. Cl. 156—157 4 Claims

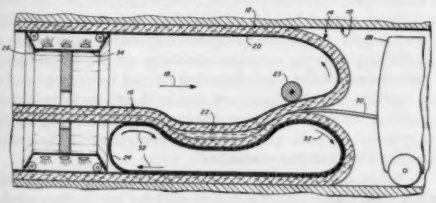


1. A method of sealing together portions of at least two flexible plastic sheets without substantial extrusion of material between said sheets comprising the steps of:
(a) overlying the sheets on a flat surface having a pair of spaced recessed grooves which define therebetween the seal area of the sheets,
(b) simultaneously compressing the sheets onto said surface over the entire seal area and on both sides thereof,
(c) heating the sheets simultaneously with step (b) only in the seal area to extrude material from the seal area into said grooves to form a seal having strengthened edges which conform to the configuration of said grooves and which strengthened edges have a thickness greater than the combined thickness of the overlying sheets.

4,135,958
METHOD OF LINING A PASSAGEWAY WITH A RESIN ABSORBENT TUBE

Eric Wood, Ossett, England, assignor to Insituform International Inc., England

Filed Dec. 29, 1977, Ser. No. 865,375
Claims priority, application United Kingdom, Jan. 25, 1977, 2895/77
Int. Cl.[2] B29C *17/00*
U.S. Cl. 156—199 5 Claims

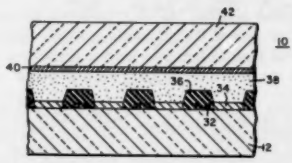


1. A method of forming a tubular resin impregnated lining in a passageway, comprising the steps of
(a) causing a tube of resin absorbent material to evert into the passageway by applying fluid pressure to the interior of the everted tube to force the uneverted portion of the tube to move into the passageway through the everted portion of the tube,
(b) causing a reservoir of resin to be located in the uneverted portion of the tube which is just behind the portion of the tube that is everting into the passageway whereby the resin absorbent material is soaked by the resin in the reservoir just before that material everts, and
(c) supporting the uneverted tube at the location of the reservoir of resin by means that move along the passageway as the tube everts.
2. The method according to claim 1, further comprising the step of
(d) disposing means inside the everted tube which moves along the passageway as the tube everts and causes the resin in the absorbent material to cure and form a rigid lining in the passageway.

4,135,959
METHOD OF MANUFACTURE OF FLAT PANEL DISPLAY DEVICE

Fang-Chen Luo, Wilkins Township, Allegheny County, and Thomas P. Brody, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 634,216, Nov. 21, 1975, Pat. No. 4,042,854. This application Mar. 23, 1977, Ser. No. 780,611
Int. Cl.[2] H05B *35/00;* B05D *5/12*
U.S. Cl. 156—230 4 Claims



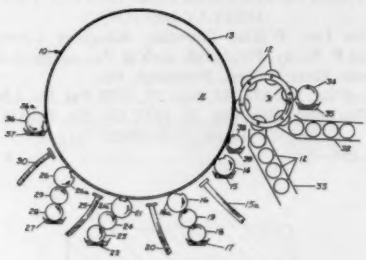
1. Method of fabricating an electroluminescent display panel comprising an X-Y array of display elements each of which comprises integral thin film switching and control circuit elements disposed on an insulative panel substrate and interconnected by an orthogonal matrix of rows and columns of switching signal, information signal, and power signal buses which define the array of display elements and each display element including an individual electroluminescent electrode disposed on the substrate and electrically connected to the thin film switching and control circuit elements with an electrical insulation layer covering the circuit elements and the buses, and an electroluminescent phosphor layer disposed over the entire panel area in electrical contact with the electroluminescent electrodes and over the insulation layer, and a second common light transmissive electroluminescent electrode covering and contacting the phosphor layer, which method comprises;
(a) depositing the interconnected array of thin film switching and control elements and signal buses, and the first electroluminescent electrode on the substrate by successive vacuum deposition of conductive metal, insulating metal oxide, and semiconductive material in patterns which define and interconnect the display elements;
(b) applying a relatively thick laminated photopolymerizable insulator layer over the entire area of the panel over the deposited elements;
(c) exposing to radiation the photopolymerizable insulator layer disposed over the thin film elements and the signal buses while not exposing the area over the first electroluminescent electrode to thereby polymerize the exposed portions;
(d) removing the unexposed portions of the insulator layer to expose the first electroluminescent electrode;
(e) depositing a layer of electroluminescent phosphor over the entire panel;
(f) depositing a light transmissive conductive top electrode onto the top surface of the electroluminescent phosphor layer.

4,135,960

TOTAL IMAGE TRANSFER PROCESS

Laurence V. Shuppert, Neenah; William D. Hanson, Appleton, and Robert A. Willer, Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 597,534, Jul. 21, 1975, Pat. No. 4,035,214.
This application Apr. 14, 1977, Ser. No. 787,525
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.[2] B44C *1/16*; B32B *1/10*; B41M *1/18*
U.S. Cl. 156—240 7 Claims



1. A process for multicolor printing of an article by transferring multiple ink films simultaneously to a receiving surface on an article to be printed, comprising the steps of:

(a) applying a substantially transparent film forming release fluid in a film onto a release surface of a continuously rotating release blanket, said release fluid being capable of wetting said release surface and of increasing its own cohesion after application thereof;

(b) applying from an ink applying raised pattern surface of a flexographic applicator plate a first film forming flexographic ink fluid of a first color in a film defining a pattern onto said release film on said release surface, said ink fluid being capable of wetting said release film and being capable of being applied from said ink applying surface to said release film without picking said release film;

(c) applying from an ink applying raised pattern surface of a flexographic applicator plate at least one additional film forming flexographic ink fluid in a film defining a pattern onto said release film and over all previously applied ink films including said first ink film, each said additional ink film being of a different color than all previously applied ink films, and each said additional ink film being capable of wetting said release film and being capable of being applied from said ink applying surface without picking said release film and said previously applied ink films;

(d) applying an adhesive fluid in a film to the receiving surface, said adhesive fluid film providing adhesion by contact pressure and being capable of having greater adhesion to said ink films and said release film and to said receiving surface than the adhesion of said release film to said release surface;

(e) contacting at least a portion of said release film and said ink films on said release surface with said adhesive film on the receiving surface to provide greater adhesion of said ink films and said release film and said receiving surface to said adhesive film than the adhesion of said release film to said release surface; and

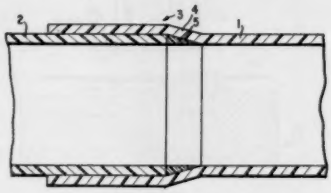
(f) drawing apart said release surface and the receiving surface whereby said portion of said ink films and said release film which are in contact with said adhesive film adhere intact to said adhesive film on the receiving surface with resulting total transfer of the films on said release surface to the receiving surface.

4,135,961

METHOD OF MOLDING A SOCKET PART ON A SYNTHETIC RESINOUS PIPE END

Tadao Yoshizawa, and Masayuki Sakaguchi, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Aug. 27, 1976, Ser. No. 718,382
Claims priority, application Japan, Aug. 30, 1975, 50-105542; Nov. 11, 1975, 50-136113; Mar. 11, 1976, 51-26886
Int. Cl.[2] B29D *23/00*
U.S. Cl. 156—242 13 Claims



1. A method of molding a socket part on a first synthetic resinous pipe end wherein a socket part for use in the connection of pipes is molded within one end of said first synthetic resinous pipe, while a filler ring, which fills up a clearance produced between the socket part and an end of a second synthetic resinous pipe inserted in the socket part of said first synthetic resinous pipe, serves in the capacity of stopper to regulate the insertion extent of said second synthetic resinous pipe such that said filler ring is loaded at the same time of the formation of the socket part, comprising the steps of:

loading a filler ring, having an external diameter slightly larger than the internal diameter of said socket part which is to be molded, on a core mold including a second wall surface which is built in a member constituting the external circumferential surface of said core mold;

holding said filler ring on a holding means provided on said core mold for expanding said filler ring radially from therewithin;

inserting a heat softened end of said first synthetic resinous pipe over said core mold and filler ring which is thereby held concentrically and in correct roundness to mold said socket part and to embed said filler ring on the inner surface of said first synthetic resinous pipe; and,

removing said core mold while retaining said filler ring within said socket part after the completion of the molding such that said filler ring is arranged between said socket part and said inserted end of said second synthetic resinous pipe wherein said holding means for said filler ring supports said filler ring through the medium both of a shifting member arranged movably on the circumferential surface in the axial direction of said core mold and of a spring ring arranged on the inclined surface of said shifting member, thereby holding said filler ring by the expansion of said spring ring in proportion to the movement of said shifting member.

3. A method of molding a socket part on a first synthetic resinous pipe end wherein a socket part for use in the connection of pipes is molded within one end of said first synthetic resinous pipe, while a filler ring, which fills up a clearance produced between the socket part and an end of a second synthetic resinous pipe inserted in the socket part of said first synthetic resinous pipe, serves in the capacity of a stopper to regulate the insertion extent of said second synthetic resinous pipe such that said filler ring is loaded at the same time of the formation of the socket part, comprising the steps of:

loading a filler ring, having an external diameter slightly larger than the internal diameter of said socket part which is to be molded, on a core mold including a second wall surface which is built in a member constituting the external circumferential surface of said core mold;

holding said filler ring on a holding means provided on said

core mold for expanding said filler ring radially from therewithin;

inserting a heat softened end of said first synthetic resinous pipe over said core mold and filler ring which is thereby held concentrically and in correct roundness to mold said socket part and to embed said filler ring on the inner surface of said first synthetic resinous pipe; and,

removing said core mold while retaining said filler ring within said socket part after the completion of the molding such that said filler ring is arranged between said socket part and said inserted end of said second synthetic resinous pipe wherein said holding means for said filler ring is constructed in such a manner that said filler ring can be held by a plurality of slide pieces provided both along a concave step part which is formed in the circumference of said core mold and along the inclined surface which is formed in said concave step part, and that said slide pieces will be able to hold said filler ring by being expanded in the centrifugal direction through the aid of a shifting annulus provided on the front of the external circumference of said core mold.

4. A method of molding a socket part on a first synthetic resinous pipe end wherein a socket part for use in the connection of pipes is molded within one end of said first synthetic resinous pipe, while a filler ring, which fills up a clearance produced between the socket part and an end of a second synthetic resinous pipe inserted in the socket part of said first synthetic resinous pipe, serves in the capacity of a stopper to regulate the insertion extent of said second synthetic resinous pipe such that said filler ring is loaded at the same time of the formation of the socket part, comprising the steps of:

loading a filler ring, having an external diameter slightly larger than the internal diameter of said socket part which is to be molded, on a core mold including a stepped wall surface which is built in a member constituting the external circumferential surface of said core mold;

holding said filler ring on a holding means provided on said core mold for expanding said filler ring radially from therewithin;

inserting a heat softened end of said first synthetic resinous pipe over said core mold and filler ring which is thereby held concentrically and in correct roundness to mold said socket part and to embed said filler ring on the inner surface of said first synthetic resinous pipe; and,

removing said core mold while retaining said filler ring within said socket part after the completion of the molding such that said filler ring is arranged between said socket part and said inserted end of said second synthetic resinous pipe wherein prior to said step of inserting said end of said first synthetic resinous pipe over said core mold and said step of holding said filler ring concentrically, said first synthetic resinous pipe is concentrically centered and guided in front of the holding means for the filler by guide means and wherein said centering guide means for said first synthetic pipe is constructed so as to support the internal circumference of the inserted pipe by arranging a plurality of members on the top of the core mold so as to be biased to project up at all times.

5. A method of molding a socket part on a first synthetic resinous pipe end wherein a socket part for use in the connection of pipes is molded within one end of said first synthetic resinous pipe, while a filler ring, which fills up a clearance produced between the socket part and an end of a second synthetic resinous pipe inserted in the socket part of said first synthetic resinous pipe, serves in the capacity of a stopper to regulate the insertion extent of said second synthetic resinous pipe such that said filler ring is loaded at the same time of the formation of the socket part, comprising the steps of:

loading a filler ring, having an external diameter slightly larger than the internal diameter of said socket part which is to be molded, on a core mold including a stepped wall surface which is built in a member constituting the external circumferential surface of said core mold;

holding said filler ring on a holding means provided on said core mold for expanding said filler ring radially from therewithin;

inserting a heat softened end of said first synthetic resinous pipe over said core mold and filler ring which is thereby held concentrically and in correct roundness to mold said socket part and to embed said filler ring on the inner surface of said first synthetic resinous pipe; and,

removing said core mold while retaining said filler within said socket part after the completion of the molding such that said filler ring is arranged between said socket part and said inserted end of said second synthetic resinous pipe wherein prior to said step of inserting said end of said first synthetic resinous pipe over said core mold and said step of holding said filler ring concentrically, said first synthetic resinous pipe is concentrically centered and guided in front of the holding means for the filler by guide means and wherein said centering guide means for said first synthetic resinous pipe is constructed in such a manner that a plurality of slide pieces are radially arranged so as to be biased by a spring ring in the axial direction of the core mold, while their expansion operation is executed by a ring which expands the respective bases of said slide pieces.

8. A method of molding a socket part on a first synthetic resinous pipe end wherein a socket part for use in the connection of pipes is molded within one end of said first synthetic resinous pipe, while a filler ring, which fills up a clearance produced between the socket part of said first synthetic resinous pipe, serves in the capacity of a stopper to regulate the insertion extent of said second synthetic resinous pipe such that said filler ring is loaded at the same time of the formation of the socket part, comprising the steps of:

loading a filler ring, having an external diameter slightly larger than the internal diameter of said socket part which is to be molded, on a core mold including a stepped wall surface which is built in a member constituting the external circumferential surface of said core mold;

holding said filler ring on a holding means provided on said core mold for expanding said filler ring radially from therewithin;

expanding said holding means to shift said filler ring in a radial direction; and

inserting a heat softened end of said first synthetic resinous pipe over said core mold and filler ring which is thereby held concentrically and in correct roundness by said expanded holding means to mold said socket part; and,

removing said core mold while retaining said filler ring within said socket part after the completion of the molding such that said filler ring is arranged between said socket part and said inserted end of said second synthetic resinous pipe.

4,135,962

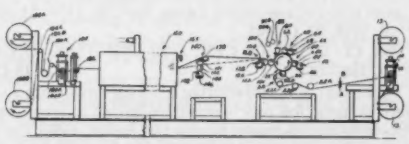
APPARATUS FOR DECORATING SHEET MATERIAL

Robert I. Sinclair, Mendham; Frederick D. Godfrey, Jr., Maplewood, both of N.J., and John J. Fedro, Wilkes-Barre, Pa., assignors to Consolidated Cigar Corp., New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 727,052

Int. Cl.[2] B44B *5/00*

U.S. Cl. 156—387 **25 Claims**



11. Apparatus for decorating at least one layer of manufactured cigar wrapper sheet material and laminating said one layer to a second undecorated layer of sheet material, said apparatus comprising:

a rotatably mounted central guide cylinder;

a decorating roller positioned about said central guide cylinder, said decorating roller having a decorative pattern on its outer surface and being mounted to rotate in a direction opposite from the direction of rotation of said cylinder in order to draw said at least one layer of sheet material through the nip between said cylinder and said decorating roller in order to emboss a decorative vein-like pattern on said at least one layer forming a raised pattern on one surface of said one layer and a complimentary depressed pattern on said opposite surface;

means for reinforcing said vein-like pattern, said means including a hopper mounted adjacent to said cylinder, said hopper adapted to contain a filler material and further adapted to continuously and controllably deposit said filled material through distribution means on said hopper along the opposite surface of said one layer as it passes around said cylinder, said reinforcing means further including means to compress the filler material within said depressed pattern and to remove excess filler material from said opposite surface; and

an internally heated laminating roller positioned about said cylinder, said laminating roller adapted to rotate in a direction opposite from the direction of rotation of said cylinder in order to draw the one decorated layer of sheet material and the second undecorated layer of sheet material through the nip between the cylinder and said laminating roller.

4,135,963

LITHIUM TANTALATE SINGLE CRYSTAL GROWTH FROM A PLATINUM-RHODIUM CRUCIBLE IN AN INERT GAS, NITROGEN OR REDUCING GAS ATMOSPHERE

Tsuguo Fukuda, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 23, 1977, Ser. No. 854,075

Claims priority, application Japan, Nov. 25, 1976, 51-140745

Int. Cl.[2] B01J *17/18*; C01G *35/00*

U.S. Cl. 156—617 SP **4 Claims**

1. A method of manufacturing a single crystal of lithium tantalate by bringing a seed crystal of lithium tantalate into contact with a melt consisting essentially of lithium tantalate in a crucible and pulling the molten mass containing said seed crystal out of the crucible to form said single crystal, the improvement comprising forming a single crystal from said melt in said crucible, said crucible consisting essentially of a platinum-rhodium alloy containing between 20 and 40% by weight rhodium, in an atmosphere selected from the group consisting of nitrogen, reducing gas, inert gas, and mixtures thereof, supplied at a flow rate between 0.1 and 10 liters per minute, to form a lithium tantalate single crystal containing between 5 and 30 ppm by weight rhodium.

4,135,964

METHOD OF MANUFACTURING DIE FOR EMBOSSING CIRCUIT PATTERN

Yasuyuki Tanaka, Isuchiura, and Kazuo Nakajima, Inashiki, both of Japan, assignors to Nippon Mektron Kabushiki Kaisha, Tokyo, Japan

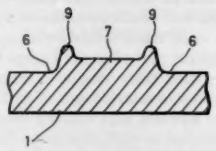
Filed Apr. 27, 1977, Ser. No. 791,289

Claims priority, application Japan, Nov. 30, 1976, 51-144195; Sep. 28, 1976, 51-116843

Int. Cl.[2] C23F *1/02*; C23C *1/00*; C03C *15/00, 25/06*

U.S. Cl. 156—661 **15 Claims**

1. A method of manufacturing a die for embossing a circuit pattern of metal foil onto a substrate having a circuit pattern, the die to be manufactured having two raised blades, the width of each defining a contour of the desired circuit pattern, the blades being spaced apart by a first surface or recess and being bordered by a second surface or groove recessed from the blades a greater amount than the first surface, comprising the steps of: forming a coating layer on the die so as to leave the contour of the desired circuit pattern uncoated, forming a first coating pattern on the uncoated area, the coating layer and the first coating pattern being exposed, partly stripping said coating layer to expose the second surface, removing from said



second surface a predetermined amount of the die material to form grooving for receiving the embossed metal foil, stripping away the entire coating layer, removing from said first surface and second surfaces a predetermined amount of the die material, and stripping away said first coating pattern.

4,135,965

PROCESS AND APPARATUS FOR THE TREATMENT OF LIQUIDS CONTAINING SOLID PARTICLES

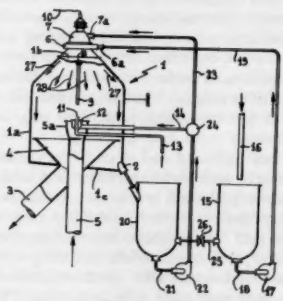
Jean-François Vicard, Lyons, France, assignor to Societe Lab, Villeurbanne, France

Filed Jan. 14, 1977, Ser. No. 759,607

Claims priority, application France, Jan. 15, 1976, 76 01498

Int. Cl.[2] B01D *1/24*

U.S. Cl. 159—4 CC **9 Claims**



4. Apparatus for heat treating a mixture of solids contained within a liquid by contacting the mixture with a flow of treatment gas, the apparatus comprising:

(a) a treatment chamber having side walls including downwardly diverging side wall portions surrounding a central axis of the chamber;

(b) a first mixture inlet at the top of said side wall portion and including annular means for forming a film of the mixture on the diverging side wall portions, the film running down the side walls;

(c) outlet means connected with the side walls and operative to collect an intermediate enriched mixture descending from the side walls;

(d) a second mixture inlet at the top of said side wall portions disposed within said annular film-forming means and including spraying means having a spraying pattern directed axially downwardly in the chamber and shaped to remain out of contact with the side portions and walls;

(e) means operative to introduce said intermediate mixture from said outlet means into said second inlet;

(f) means for blowing said treatment gas upwardly into said chamber into contact with said film and said spray pattern; and

(g) hopper means in the chamber below the spray pattern and disposed thereopposite and operative to separate

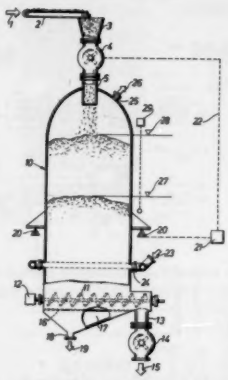
sprayed solids from said film and collect the solids and conduct them outside the chamber.

4,135,966

METHOD AND DEVICE FOR EQUALIZING THE MOISTURE CONTENT OF POROUS MATERIAL

Stig Glöersen, Edsgatan, POB 4502 Karlstad, Sweden

Filed Sep. 10, 1975, Ser. No. 611,925
Claims priority, application Sweden, Sep. 10, 1974, 7411396
Int. Cl.[2] D21C *1/02, 3/24, 7/00, 7/06*
U.S. Cl. 162—17 **6 Claims**



1. A method for automatically maintaining the moisture content of porous material in a fluid treatment chamber which material is continuously fed to a fluid treatment container, continuously treated with fluid, and continuously discharged from said container wherein the moisture content is maintained at a value which corresponds to the original weight of the container and porous material and fluid contained therein comprising the steps of:

continuously weighing said container and porous material and fluid contained therein;

continuously comparing the total weight of said container and said porous material and fluid contained therein with the original weight thereof corresponding to the original moisture content of the material in the fluid treatment chamber;

generating correction signals when the total weight of said container, said porous material, and fluid differ from said original weight; and

modifying the dwell time of said porous material in said fluid treatment chamber in response to said correction signals to continously tend to maintain the total weight of said container, porous material and fluid therein at a value corresponding to said original moisture content.

4. An apparatus for automatically maintaining the moisture content of porous material in a fluid treatment chamber, which material is continuously fed to an inlet in a fluid treatment container, continuously treated with fluid, and continuously discharged from an outlet in said container wherein the moisture content is maintained at a value which corresponds to the original weight of the container and porous material and fluid contained therein comprising:

means for continuously weighing said container and porous material and fluid contained therein;

means for continuously comparing the total weight of said container and said porous material and fluid contained therein with the original weight corresponding to the original moisture content of the material in the fluid treatment chamber and for generating correction signals when the total weight of said container, said porous material, and said fluid differ from said original weight; and

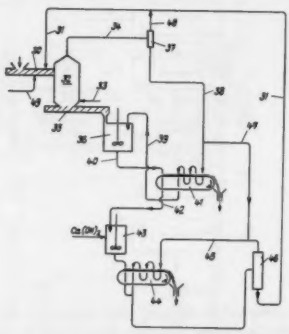
means for modifying the dwell time of said porous material in said fluid treatment chamber in response to said control signals to continuously tend to maintain the total weight of said container, porous material, and said fluid at a value corresponding to said original moisture content.

4,135,967

PROCESS FOR PRODUCING CELLULOSE PULP BY SOLID PHASE DIGESTION

André Fogarassy, Paris, France, assignor to Societe Generale de Brevets Industriels et Ohimiques, Fribourg, Switzerland

Continuation of Ser. No. 560,229, Mar. 20, 1975, abandoned, which is a continuation of Ser. No. 341,508, Mar. 15, 1973, Pat. No. 3,887,426, which is a continuation of Ser. No. 74,671, Sep. 23, 1970, abandoned. This application Feb. 28, 1977, Ser. No. 772,954
Claims priority, application Switzerland, Sep. 26, 1969, 14522/69; Dec. 5, 1969, 18197/69
The portion of the term of this patent subsequent to Jun. 3, 1992, has been disclaimed.
Int. Cl.[2] D21C *3/20*
U.S. Cl. 162—29 **11 Claims**



1. In a process for producing cellulose pulp comprising digesting wood chips by heating the wood chips at a temperature above 100° C in contact with a concentrated solution of a hydroxide or salt of an alkali metal, alkaline earth metal or ammonium in a solvent which consists of one or more substances which have boiling points above 100° C under atmospheric pressure and selected from the group consisting of monohydroxy alcohols, ethylene glycol and glycerol to solubilize the lignin and then separating the cellulose pulp from the solubilized lignin, the improvement consisting of heating the wood chips in contact with an amount of said solution such that substantially all the solution is absorbed by the wood, said amount of absorbed solution being obtained by impregnating the wood chips with said concentrated solution and allowing any excess solution to drain off prior to heating, and said heating step being carried out in a solid phase such that said wood chips are not suspended in said concentrated solution.

10. Process as claimed in claim **1**, wherein the following operations are conducted in the form of a continuous manufacturing process: wood chips impregnated with the above solution are charged into a digester, the mixture is digested at a temperature maintained above 100° C, the digested mixture is removed from the digester, the mixture being in the form of a solid mass consisting of cellulose pulp impregnated with a solution containing lignin, the pulp is dispersed in the effluent wash waters from the subsequent pulp filtration, forming a suspension of cellulose pulp in an aqueous solution containing lignin, the resulting mixture is filtered, the yield of cellulose pulp is washed with water on the filter, the effluent wash waters being used for the dispersion mentioned above, to the filtrate there is added calcium hydroxide, which precipitates the lignin in the form of a suspension of calcium lignate, the mixture is filtered, the yield of calcium lignate is washed with water, the effluent wash waters are combined with the filtrate,

the mixed liquids are distilled, the resulting distilled water is the water used for washing the calcium lignate on the filter, the tail fraction from the distillation is recycled and used as the solvent for impregnating the wood chips.

4,135,968

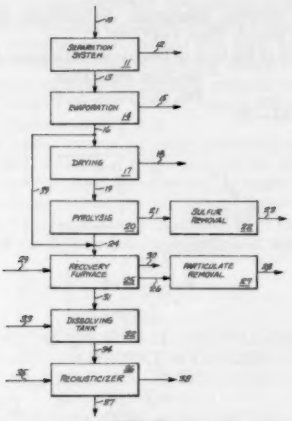
SPENT LIQUOR TREATMENT

Gerrit G. Dehaas, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 645,972, Apr. 9, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 764,307

Int. Cl.² D21C *11/04, 11/12*

U.S. Cl. 162—30 R **11 Claims**



1. The process of increasing the capacity of a recovery furnace for alkaline spent pulping liquor which contains both inorganic and organic material and from which chemical and energy values are recovered in said furnace, comprising:

concentrating said liquor to a solids content of between 55 and 65% by weight,

dividing said liquor into two portions, one of said portions containing between 10 and 65% by weight of the total solids in said liquor and the other of said portions containing the remainder of said liquor solids,

pyrolyzing said one portion of said liquor to convert part of its organic material to a fuel gas and the balance to a solid pyrolysis residue consisting of carboniferous char containing the inorganic material, and to reduce the original fuel value of said one portion of said liquor by 25 to 70% during said pyrolysis; and

combusting said solid pyrolysis residue and said other portion of said liquor in said chemical recovery furnace to convert substantially all of said carboniferous char and said organic material to heat energy.

4,135,969

GLYCIDALDEHYDE MODIFIED CATIONIC POLYACRYLAMIDE POLYMERS USED IN PAPER

David R. Cosper, Downers Grove, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Feb. 25, 1974, Ser. No. 445,220

Int. Cl.² D21H *3/48*

U.S. Cl. 162—167 **2 Claims**

1. A method of treating paper to increase wet and dry tensile strengths, comprising; adding to a paper slurry a reaction product of (1) glycidaldehyde and (2) a polyacrylamide containing both (a) tertiary amine cationic reactive sites and (b) amide reactive sites; said reaction product containing unreacted aldehyde reactive to cellulose; the added reaction product being in an amount effective to impart enhanced strength to the paper; and subsequently subjecting the slurry to sheet formation.

4,135,970

SYSTEM FOR DETECTING THE FAILURE OF A NUCLEAR FUEL ROD IN A NUCLEAR REACTOR

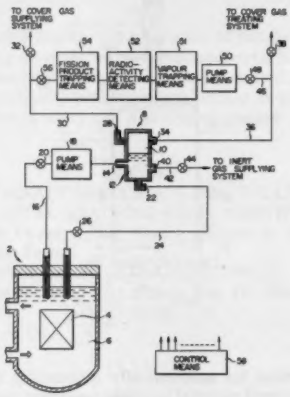
Norimasa Mitsutsuka, Yamato; Katsumi Kubo, Fujisawa, and Tatsuo Miyazawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 772,981

Claims priority, application Japan, Feb. 27, 1976, 51-20902

Int. Cl.² G21C *17/00*

U.S. Cl. 176—19 LD **18 Claims**



1. A system for detecting a failure of a nuclear fuel rod in a nuclear reactor comprising the steps of (a) sampling a coolant in the nuclear reactor, (b) introducing the sampled coolant into a cover gas-sealed first gas-liquid separator to remove xenon already mixed in the coolant, (c) cooling the coolant and passing the cooled coolant through an iodine adsorption device where iodine in the coolant is adsorbed on the iodine adsorption device, (d) stopping the sampling of the coolant from the nuclear reactor after a predetermined amount of coolant is passed through the adsorption device, (e) heating the coolant in the first gas-liquid separator and iodine adsorption device, (f) circulating the heated coolant through the first gas-liquid device and iodine adsorption device to permit xenon produced by decay of iodine adsorbed on the iodine adsorbing device to be moved into the cover gas in the first gas-liquid separator, and (g) introducing the xenon-entrained cover gas into a radioactivity detection where the radioactivity of xenon is detected.

4,135,971

HYDRAULIC HOLD-DOWN FOR NUCLEAR REACTOR FUEL

John N. Calvin, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

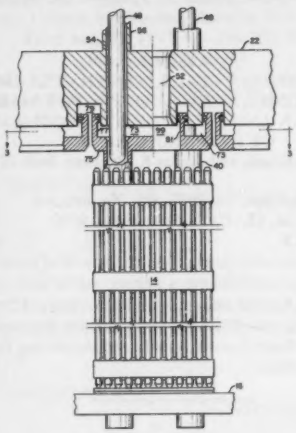
Filed Apr. 4, 1977, Ser. No. 784,189

Int. Cl.² G21C *15/00*

U.S. Cl. 176—50 **7 Claims**

1. In a nuclear reactor having a pressure vessel and a core within the pressure vessel, said core comprised of a plurality of fuel assemblies each comprised of a plurality of vertically oriented fuel elements, the reactor having fluid under pressure passed upwardly over said fuel elements; the improvement comprising: a pressure plate attached to the upper end of a fuel assembly, and integral therewith and having an upper surface and a lower surface; said lower surface exposed to the fluid at the fuel assembly outlet, and means for exposing said upper surface to the fluid at a pressure greater than the fuel assembly outlet pressure from a location upstream with respect to fluid

flow of said fuel assemblies a sealing core plate spaced above said pressure plate and in sealing engagement with the periphery thereof so as to form a pressurizable plenum defined by the upper surface of said pressure plate and the lower surface of said seal plate.

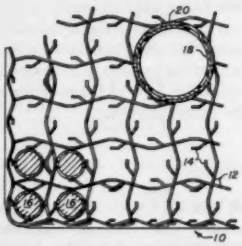


4,135,972

NUCLEAR REACTOR SPACER ASSEMBLY

Andrew J. Anthony, Tariffville, and Malcolm D. Groves, Suffield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 29, 1976, Ser. No. 671,596
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **5 Claims**



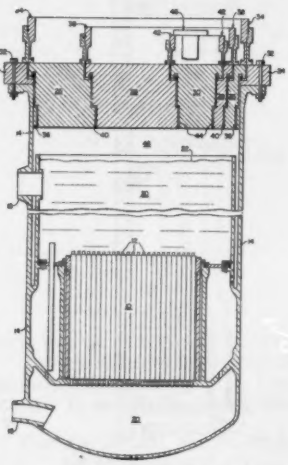
1. A method for the fabrication of a nuclear reactor fuel assembly, the fuel assembly including at least a first grid structure formed of web members fabricated from a first metal, the grid structure web members defining at least a first opening for receiving a guide tube formed of a second metal dissimilar to said first metal, the assembly technique comprising the steps of:
- selecting an open ended cylindrical sleeve, said sleeve being continuous at its oppositely disposed ends and having an outer diameter commensurate with the outer diameter of a guide tube to be passed through the guide tube opening in the grid;
- forming a plurality of circumferentially displaced windows in the sleeve, said windows having an axial length commensurate with the width of the spacer grid and a width determined by the grid geometry, said windows being located intermediate the length of the sleeve;
- inserting the sleeve into the guide tube opening in the spacer grid with the windows in registration with those regions where the spacer grid defining web members approach closest to the sleeve;
- swaging the sleeve radially outwardly along its entire length whereby the inner diameter of the sleeve along its entire length will be caused to be in excess of the outer diameter of the guide tube and the grid web members will be laterally captured by the upper and lower edges of the sleeve windows, the expansion of the sleeve also loading the sleeve against the grid in the radial direction with contact established between the side edges of the sleeve windows and the grid web members;
- inserting the guide tube through the sleeve; and
- affixing the sleeve to the guide tube by fusion bonding or swaging so as to prevent lateral movement between the tube and sleeve.

4,135,973

CORE DISRUPTIVE ACCIDENT MARGIN SEAL

Martin P. Golden, Penn Township, Allegheny County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,328
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—87 **1 Claim**



1. A nuclear reactor system including a vessel, fuel assemblies positioned therein, an inlet and an outlet for circulating a coolant in heat transfer relationship with said fuel assemblies, and a closure head disposed on said vessel in a fluid-tight relationship, said closure head comprising:
- a substantially cylindrical outer riser assembly disposed on said reactor vessel and having a forked member disposed therein;
- a substantially cylindrical inner riser assembly disposed in said outer riser assembly and defining an annulus between said riser assemblies;
- an elastomer ring having a corrugated contact surface disposed in said forked member and extending near said annulus for sealing said annulus;
- a tubular inflatable seal disposed in said forked member near said elastomer ring for expanding against said elastomer ring when inflated thereby causing said elastomer ring to radially expand against said inner riser assembly thus sealing said annulus;
- a metallic stem attached to said tubular inflatable seal and a passageway connected between said metallic stem and a gas source for conducting a gas from said gas source to said tubular inflatable seal for inflating said tubular inflatable seal;
- a check valve disposed in said passageway for selectively preventing deflation of said inflatable seal; and
- a conduit disposed in said forked member and having one end disposed in fluid communication with the side of said

tubular inflatable seal that is opposite said elastomer ring and having the other end disposed in fluid communication with said annulus below said tubular inflatable seal whereby increased pressure in said annulus below said tubular inflatable seal will be transmitted through said conduit and against said tubular inflatable seal, thus further expanding said tubular inflatable seal and said elastomer ring and thus enhancing contact between said corrugated contact surface and said inner riser assembly.

4,135,974

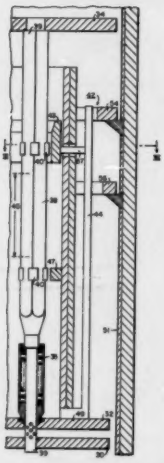
NUCLEAR CORE POSITIONING SYSTEM

Hans D. Garkisch, Irwin; Howard W. Yant, Greensburg, and John F. Patterson, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 210,447, Dec. 21, 1971, now Defensive Publication No. T911,015. This application May 17, 1974, Ser. No. 471,068

Int. Cl.[2] G21C *9/00, 19/00*

U.S. Cl. 176—87 **6 Claims**



1. In a nuclear reactor which comprises a nuclear core including a plurality of vertically oriented elongated fuel assemblies supported in a side-by-side relationship, and wherein the assemblies are supported between an upper core plate and a lower core plate and each assembly includes nozzles which are supported within openings in said core plates for laterally positioning same;

a radial restraint system surrounding said fuel assemblies for applying a constraining force to said nuclear core when said core is under operating conditions;

vertically oriented resilient members positioned adjacent the core and supported at at least one end;

load transmitting means interposed between said resilient members and the periphery of said nuclear core for transmitting resistance to displacement to said fuel assemblies as same tend to be displaced by thermal bowing and nuclear induced swelling and creep;

a first relatively stiff band surrounding said resilient members and displaced therefrom a first predetermined distance so as to increase the resistance to displacement of said resilient member and said fuel assemblies after a small displacement of same, said band being arranged and constructed to expand only a predetermined fraction of the expansion of the core upon an increase in temperature,

a second relatively stiff band surrounding said resilient members and displaced a second predetermined distance from said resilient members, said second predetermined distance being greater than said first predetermined distance so as to further increase resistance to displacement as greater displacements occur.

4,135,975

OBTAINING HUMAN CELL LINES THAT ELABORATE COLONY STIMULATING ACTIVITY FOR MARROW CELLS OF MAN AND OTHER SPECIES AND METHODS OF PREPARING SAME

Marshall A. Lichtman, and James K. Brennan, both of Rochester, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,364

Int. Cl.[2] C12B *3/00;* **C12K** *9/00*

U.S. Cl. 195—1.8 **8 Claims**

1. A method for stimulating in-vitro growth of bone marrow cells comprising conditioning a culture media with an active amount of a CSA agent defined as initially obtained from GCT or RC4 cells and their fragments; innoculating the conditioned media with the desired marrow cells; and incubating the resulting modified culture.

4,135,976

TREATMENT OF PHOTOGRAPHIC PROCESSING EFFLUENTS USING PHOTOSYNTHETIC SULFUR BACTERIA

Masao Kitajima, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 10, 1977, Ser. No. 776,556

Claims priority, application Japan, Mar. 11, 1976, 51/26278; May 4, 1976, 51/49848

Int. Cl.[2] C02C *5/10;* **C22B** *11/00*

U.S. Cl. 195—2 **18 Claims**

1. A process for recovering silver from and purifying a waste fixing solution used for the fixing of a silver-halide photographic material containing at least one silver-thiosulfate complex salt which comprises applying photosynthetic sulfur bacteria to the waste fixing solution, under substantially anaerobic conditions with irradiation of light, cultivating the cells of the bacteria to concentrate and accumulate silver in the waste solution into the cells of the bacteria as silver metal or insoluble silver salts, recovering the cells of the bacteria and separating silver or silver salts from the cells.

4,135,977

PROCESS FOR PRODUCTION OF CYCLODEXTRIN

Koki Horikoshi, Tokyo, and Nobuyuki Nakamura, Kunitachi, both of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Continuation-in-part of Ser. No. 584,653, Jun. 6, 1975, abandoned. This application Oct. 18, 1977, Ser. No. 843,263

Claims priority, application Japan, Jun. 20, 1974, 49-70377

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—7 **3 Claims**

1. A process for producing cyclodextrin in pure crystalline form from starch which comprises preparing a a solution of non-liquefied, gelatinized starch, as a starting material, adjusting the pH thereof to 6–10.5, adding thereto a cyclodextrin glycosyl transferase which has optimum pH in the alkaline side and which has been obtained by fermentation of an alkalophilic microorganism belonging to the genus bacillus and allowing cyclodextrin to be produced, filtering the reaction mixture, adding to the filtrate a glucoamylase to decompose unreacted starch contained in the filtrate, decomposing the unreacted starch with glucoamylase, concentrating the resulting filtrate to give a cyclodextrin concentrate containing cyclodextrin in an amount above 40% and adding a small amount of crystals of cyclodextrin as a seed to said concentrate to crystallize out cyclodextrin in pure crystalline form.

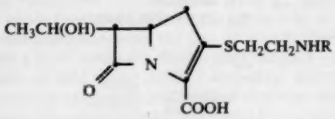
4,135,978

PRODUCTION OF N-ACYL-THIENAMYCINS

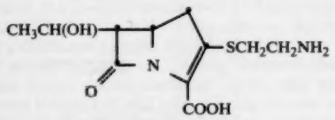
Jean S. Kahan, and Frederick M. Kahan, both of Rahway, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 19, 1977, Ser. No. 825,884
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 8 Claims

1. A method for the preparation of N-acyl thienamycins having the following structure:



wherein R is an acyl radical produced by bringing the compound thienamycin having the following structure:



into contact with an acyl compound in an aqueous medium with a penicillin amidohydrolase which, when acting on the thienamycin substrate, produces the desired N-acylated thienamycin; wherein the acyl radical is represented by the formula:

wherein X is O or S and R′ represents a straight or branched chain alkyl groups containing from 5–10 carbons, aryl, aryloxy groups containing 6–10 carbon atoms.

4,135,979

TREATMENT OF XANTHAN GUM TO IMPROVE CLARITY

Foss E. Corley, La Mesa, and Joe B. Richmon, El Cajon, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 24, 1976, Ser. No. 717,303
Int. Cl.[2] C12D *13/00, 13/04*
U.S. Cl. 195—31 P 11 Claims

1. A method for clarifying a xanthan gum produced by a bacterium of the genus *Xanthomonas* comprising filtering, at a temperature of at least about 112° C. up to a temperature beyond which thermal degradation of the gum occurs, a fermentation beer containing at least about 1.5 weight % xanthan gum, and separating the xanthan gum from the filtrate.

4,135,980

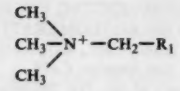
CHOLINE OXIDASE

Shigeru Ikuta; Yoshifumi Horiuchi; Hideo Misaki; Kazuo Matsuura; Shigeyuki Imamura, and Naoki Muto, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Apr. 22, 1977, Ser. No. 789,990
Claims priority, application Japan, Apr. 26, 1976, 51-47992
Int. Cl.[2] C12D *13/10;* G01N *31/14*
U.S. Cl. 195—62 21 Claims

1. An enzyme choline oxidase which has the following properties:

(1) substrate specificity: a specific activity for a compound of the formula



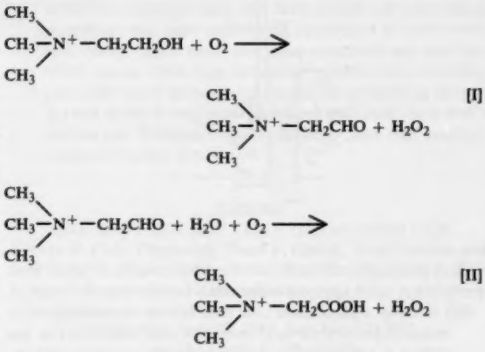
wherein R_1 is —CH_2OH or —CHO;

(2) optimum pH: pH 8 (tris-HCl buffer);

(3) isoelectric point: 4.6 (electrophoresis using carrier-type ampholyte);

(4) molecular weight: 84,000 ± 2,100 [gel filtration using Sephadex G-150];

(5) enzyme action: catalyzes the reaction [I] and/or [II]:

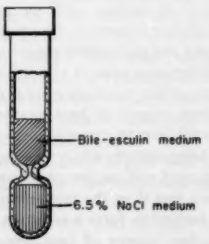


4,135,981

DEVICE FOR RECOGNITION AND DIFFERENTIATION OF GROUP D STREPTOCOCCI

Lynn B. Simpson, Corning, and Milton M. Takeguchi, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 27, 1977, Ser. No. 791,549
Int. Cl.[2] C12K *1/06, 1/10*
U.S. Cl. 195—127 4 Claims



1. A device for the simultaneous recognition and differentiation of Group D streptococcal bacteria, the device comprising a substantially cylindrical transparent test tube having upper and lower chambers separated by a connecting conduit of smaller inner diameter than either chamber, the upper chamber including a semi-solid bile-esculin medium capable of indicating the presence of group D streptococcal bacteria, and the lower chamber including a semi-solid enterococci identifying medium having a NaCl content of at least about 6.5% and separated from the medium of the upper chamber by a gas within the connecting conduit.

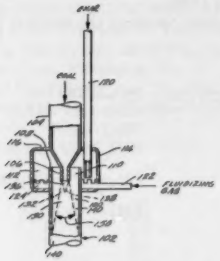
4,135,982
METHOD FOR PREVENTING PLUGGING IN THE PYROLYSIS OF AGGLOMERATIVE COALS

Norman W. Green, Upland, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 700,041, Jun. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 633,898, Nov. 20, 1975, which is a continuation of Ser. No. 449,073, Mar. 7, 1974, abandoned. This application Jan. 23, 1978, Ser. No. 871,686

Int. Cl.[2] C10B *1/00, 49/16;* C10G *1/00*

U.S. Cl. 201—12 48 Claims



1. A process for the production of hydrocarbon values from particulate, solid agglomerative coals comprising the steps of:

(a) forming a particulate coal feed stream comprising comminuted particulate agglomerative coal and a carrier gas which is substantially nondeleteriously reactive with respect to the products of pyrolysis of the agglomerative coal for injection as a turbulent, diverging jet stream from an opening into a mixing zone of an elongate pyrolysis reactor having an inner surface and a minimum internal width greater than the maximum width of the opening, simultaneous with the discharge of a particulate solid source of heat in a fluidizing gas which is substantially nondeleteriously reactive with respect to the products of pyrolysis of the agglomerative coal along the peripheral inner surface of the reactor, the diverging stream of particulate coal and solid source of heat combining in the mixing zone of the reactor prior to passage to a pyrolysis zone of the reactor and wherein substantially all of the coal in the feed stream is formed of particles which detackify prior to contact with an interior surface of the pyrolysis reactor closest to the opening;

(b) discharging the particulate source of heat and fluidizing gas into said mixing zone at a temperature greater than the temperature of the pyrolysis zone at a predetermined ratio of particulate source of heat to coal in the feed stream which is sufficient to maintain said pyrolysis zone at the pyrolysis temperature, while simultaneously injecting the particulate coal and carrier gas through the opening at a temperature less than the temperature at which the coal beings to tackify to form a resultant turbulent mixture of the particulate source of heat, the particulate coal and fluidizing and carrier gases in the mixing zone, the quantity of fluidizing gas discharged into said mixing zone with the particulate source of heat being at least sufficient to prevent backflow of the coal from the divergent stream; and

(c) passing the resultant turbulent mixture from said mixing zone to the pyrolysis zone of said pyrolysis reactor to pyrolyze the solid particulate coal and yield a pyrolysis product stream containting as solids, the particulate source of heat and a carbon containing solid residue of pyrolysis of the coal, and a vapor mixture of carrier gas and fluidizing gas and pyrolytic vapors comprising volatilized hydrocarbons.

4,135,983
METHOD FOR IMPROVING COKING PROPERTY OF COAL FOR USE IN PRODUCTION OF COKES

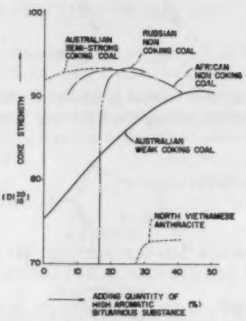
Yoshio Kiritani, Sennangun, and Michio Tsuyuguchi, Wakayama, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha and Sumikin Coke Co., Ltd., both of, Japan

Division of Ser. No. 213,037, Dec. 28, 1971, abandoned. This application Dec. 20, 1974, Ser. No. 535,025

Claims priority, application Japan, Dec. 28, 1970, 46-126248; Dec. 29, 1970, 46-127536; Jun. 1, 1971, 46-37978; Jun. 1, 1971, 46-37979; Oct. 22, 1971, 46-84259

Int. Cl.[2] C10B *57/04*

U.S. Cl. 201—25 6 Claims



1. A method for improving the coking property of coal for producing blast furnace coke, which comprises:

(a) heat-treating heavy oil from the distillation of coal tar and free from light oil components of a boiling point below 250° C. at a temperature of from 400 to 450° C. for a period of from 0.5 to 1.5 hours, thereby producing a bituminous substance; and

(b) blending said bituminous substance with raw material coal in an amount effective to increase the coking power of the raw material coal, said raw material coal being selected from the group consisting of non-coking coal, weakly coking coal, and a mixture of both.

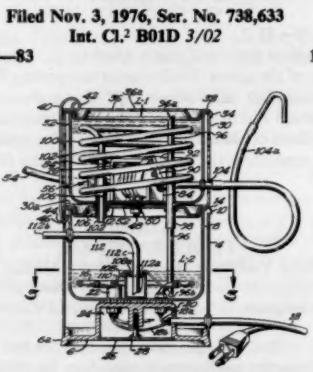
4,135,984
WATER DISTILLER

John D. Kirschmann, 933 Anderson St., Bismarck, N. Dak. 58501

Filed Nov. 3, 1976, Ser. No. 738,633

Int. Cl.[2] B01D *3/02*

U.S. Cl. 202—83 11 Claims



1. A water distiller assembly comprising:

a boiling chamber comprising a vessel having heating means operatively associated therewith for heating supply water in said vessel;

a condensing unit disposed above said boiling chamber, said condensing unit comprising a vessel having supply water inlet means connected thereto whereby supply water is contained in said vessel, and a separate, vapor flow passage disposed in heat exchange relation with supply water in said condensing vessel, and wherein

said supply water inlet means comprises an inlet tube and a flow control valve connected therein, said valve having a valve element movable relative to a valve port for regulating the flow of supply water into said condensing vessel; and

said vapor flow passage having a vapor inlet in fluid flow communication with the top of said boiling chamber and a fluid outlet for discharging distilled water externally of said water distiller assembly, whereby steam vapors generated in said boiling chamber rise into said vapor inlet, pass through said vapor flow passage and are cooled and condensed to distilled water which flows out through said fluid outlet;

a supply water condenser outlet tube extending from an inlet opening in the upper portion of said condensing vessel at a predetermined level of supply water therein downwardly into said boiling chamber and terminating at a discharge opening disposed below the normal level of supply water in said boiling chamber, the length of said supply water condenser outlet tube and the elevated location of said inlet opening thereto in said condensing vessel providing a column of supply water in said outlet tube sufficient to at least balance the vapor pressure generated in said boiling chamber, whereby preheated supply water flows by gravity through said outlet tube from said condensing vessel downwardly into said boiling chamber;

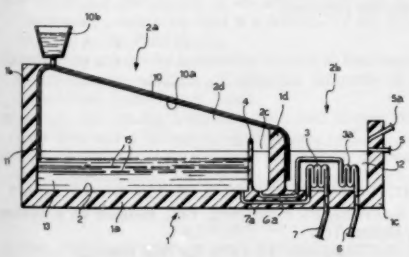
a thermostat controller operably associated with said valve element, said thermostat controller having sensing means responsive to the temperature of distilled water condensed in said vapor flow passage and operative to move said valve element in an opening direction relative to said valve port to increase the flow of supply water into said condensing vessel as the temperature of distilled water leaving said vapor flow passage increases.

4,135,985

DESALINATION OF SALT WATER BY SOLAR ENERGY MEANS

Aldo La Rocca, Moncalieri (Turin), Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed May 31, 1977, Ser. No. 801,977
Claims priority, application Italy, May 31, 1976, 68334 A/76
Int. Cl.[2] B01D *1/00*
U.S. Cl. 202—176 **6 Claims**



1. Apparatus for the desalination of salt water comprising at least one main container made of insulating material and adapted for containing salt water to be desalinated,

a transport cover for said main container, said transparent cover having a highest point and a lowest point and being made from a material which is transparent to short wavelength solar radiation and substantially opaque to longer wavelength heat radiation, whereby said cover acts as a selective filter and also serves as a condensation surface on which the water evaporated within said main container can condense,

a distillate collection container within said main container located under said lowest point of said cover to collect desalinated water condensing on the cover and running down the underside thereof to said lowest point,

a salt water input container adjacent said main container,

means for transferring salt water from said salt water input container into said main container, and

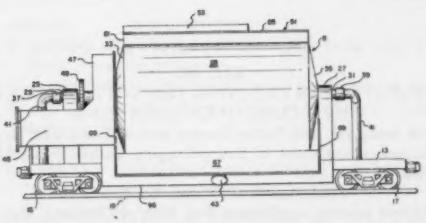
means for preheating said salt water transferred from said salt water input container before it enters said main container comprising outlet means for said main container and collection container and pipe coils in said salt water input container, said pipe coils being connected in series with said outlet means from said main container and said distilled water collection container respectively whereby said coils serve as heat exchangers for preheating incoming salt water in said input container with heat from water discharged from said main container and said distilled water collection container.

4,135,986

ONE-SPOT ROTARY COKE QUENCHING CAR

George R. Cain, Pittsburgh; Ward F. Gidick, West Newton, and William D. Edgar, Allison Park, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 785,366, Apr. 4, 1977. This application Jan. 24, 1978, Ser. No. 871,962
Int. Cl.[2] C10B *33/00, 39/10*
U.S. Cl. 202—227 **7 Claims**



1. Apparatus for receiving and transporting hot coke from a coking chamber of a coke oven battery to a quenching station where it is cooled and for transporting to and discharging said hot coke, now cooled, onto a coke wharf, comprising:

(a) a vehicle that is movable in a parallel direction along the coke side of a coke oven battery, adjacent to a coke guide of said battery and separated from said battery by the general width of said coke guide;

(b) a rotatable cylindrical drum hopper with closed ends and apertures through each of said ends, said openings aligned to the central linear axis of said drum hopper, said drum hopper having at least one port through which hot coke passes into drum hopper;

(c) trunnion means, interposed through each of said apertures, upon which said drum hopper is rotatable;

(d) conduit means, running through at least one of said trunnion means, through which fluid can be conducted;

(e) bearing means, mounted onto said vehicle, through which said trunnion means are rotatable;

(f) powered rotating means for producing rotation of said drum hopper, operable on at least one trunnion means;

(g) manifold means for conducting fluid to said conduit means;

(h) fluid entry means, located on said vehicle, through which pressurized fluid can be forced into said manifold means and said conduit means into said drum hopper;

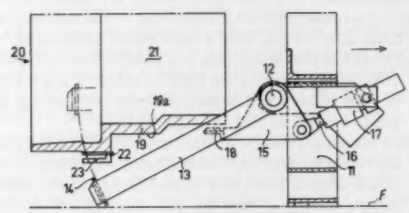
(i) slidable cover seal means linearly operable to expose and to cover and seal said at least one port;
(j) a secant plane, disposed peripherally adjacent said at least one port, within said drum hopper, linearly bisecting and fixed to the arc of said drum hopper, removed from the central axis of said drum hopper;
(k) discharge means, adjacent said at least one port, operable to both prevent and permit discharge of coke upon rotation of said drum hopper;
(l) hood means to prevent escape of pollutants to the amosphere during the gravitation of hot coke into said drum hopper through said at least one port;
(m) fume extraction means operable to extract pollutants from said drum hopper during the period when said at least one port is covered and sealed by said cover seal means;
(n) shear means by which fluid passing through said conduit means is increased in velocity and then distributed throughout said drum hopper in a flood, but prevented from becoming a spray, to quench said hot coke within said drum hopper uniformly throughout;
(o) fluid input means to introduce pressurized fluid to said fluid entry means and to pump pressurized fluid introduced to said fluid entry means through said manifold means and said conduit means and said shear means into said drum hopper; and
(p) collecting means to collect and convey steam and particulate matter, emanating from the hot coke within said drum hopper during the operation of said fluid input means, expelled from said drum hopper through said at least one port exposed by said slidable cover seal means, to a suppressor.

4,135,987

APPARATUS FOR CLEANING THE BOTTOM SURFACE OF A COKE OVEN DOOR PLUG

Erich Jorzenink, and Walter Stanke, both of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,527
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657228
Int. Cl.[2] C10B *43/04*
U.S. Cl. 202—241 **6 Claims**



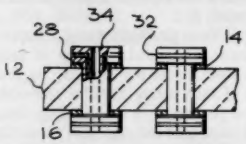
1. Apparatus for cleaning the bottom surface of a coke oven door plug, comprising a support; a tool having a scraping edge for scraping deposits off the bottom surface of a coke oven door plug; mounting means mounting said tool on said support for pivoting about a substantially horizontal axis between a lower starting position, an upper end position and at least one intermediate position in which said scraping edge engages said bottom surface; and means for urging said tool towards said upper end position and said scraping edge into yieldable engagement with said bottom surface so that said scraping edge follows vertical contour variations of said bottom surface in response to relative movement of said tool and the door plug in direction axially of the latter.

4,135,988

ONE HUNDRED PERCENT PATTERN PLATING OF PLATED THROUGH-HOLE CIRCUIT BOARDS

William P. Dugan, Pomona, and John A. Muhr, Claremont, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Jan. 30, 1978, Ser. No. 873,196
Int. Cl.[2] C25D *5/02*; H05K *3/06*
U.S. Cl. 204—15 **8 Claims**



1. A process for manufacturing an electrical printed circuit board having plated through-holes for electrically interconnecting circuits on opposite surfaces of the board, said process comprising the steps of:
(a) laminating a thin copper foil on opposite surfaces of an epoxy glass substrate;
(b) forming apertures through the laminated assembly at the locations of the desired plated through-holes;
(c) electroless copper plating the exposed surfaces of the apertures and the opposite surfaces of the substrate;
(d) applying a layer of photoresist to both opposite surfaces of the apertured laminated assembly to define resist layer portions susceptible to a chemical developer over the apertures and a desired circuit image on opposite surfaces, and resist portions resistant to chemical etchant over the remainder thereof;
(e) chemically removing those portions of the photoresist layer susceptible to the developer to expose the apertures and the desired circuit image on opposite surfaces of the substrate;
(f) removing the electroless copper plating;
(g) plating again by electroless copper plating the surfaces of the apertures and the desired circuit image to establish an initial copper thickness;
(h) electroplating with copper the surfaces of the apertures and the desired circuit image to the approximate thickness of the photoresist;
(i) electroplating the copper plating with solder;
(j) removing the remaining portions of the photoresist from the board; and
(k) chemically removing the exposed laminated copper foil from the substrate.

4,135,989

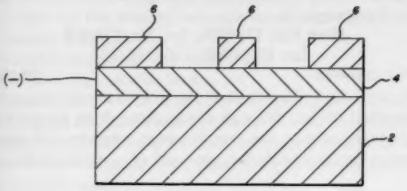
ELECTROLYTIC ETCHING OF TIN OXIDE FILMS

Barry B. Pruett, St. Petersburg, Fla., assignor to E-Systems, Inc., Dallas, Tex.

Filed Apr. 27, 1978, Ser. No. 900,482
Int. Cl.[2] C25F *3/14, 5/00*
U.S. Cl. 204—129.1 **10 Claims**

1. A process for the etching of tin oxide films from non-conductive substrate materials comprising:
(a) forming an etching pattern layer of an active metal on the tin oxide film to be etched;
(b) contacting said active metal coated tin oxide film cathodically in an electrolytic solution; and,

(c) contacting said active metal coated tin oxide film anodically in said electrolytic solution to thereby etch the portion of said tin oxide film covered by said etching pattern of active metal from said substrate.



4,135,990
SURFACE TREATMENT OF THE ANODES FOR TANTALUM CAPACITORS

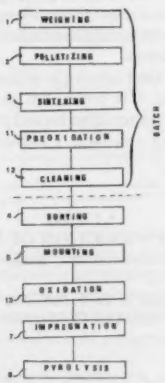
Michèle Moulin; Balint Escher; Dominique Prince, and Jean Vasseux, all of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,714

Claims priority, application France, Jan. 7, 1977, 77 00329; Aug. 4, 1977, 77 23982

Int. Cl.[2] C25D *11/26*

U.S. Cl. 204—32 R **8 Claims**



1. A method for anodically oxidizing sintered anodes for tantalum capacitors comprising:

first anodizing the anodes in an electrolytic cell to form thereon an oxide layer that is a fraction of the thickness required in the final anode,

cleaning the anodes by immersion in an acid bath consisting of an aqueous solution of effective amounts of nitric, sulfuric and hydrofluoric acids,

removing the anodes from said bath and rinsing them to neutralize any acid remaining from said bath,

further anodizing the anodes in an electrolytic cell until the oxide layer thereon has reached the required thickness.

4,135,991
BATH AND METHOD FOR ELECTROPLATING TIN AND/OR LEAD

Valerie M. Canaris, Parma, and William J. Willis, Kent, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

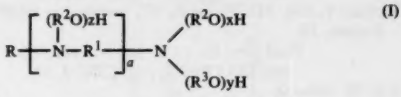
Filed Aug. 12, 1977, Ser. No. 824,043

Int. Cl.[2] C25D *3/32, 3/36, 3/60*

U.S. Cl. 204—43 S **37 Claims**

1. An aqueous acid plating bath for electrodeposition of tin, lead or tin-lead alloys comprising at least one bath-soluble metal salt selected from the group consisting of a stannous salt, a lead salt or a mixture of stannous and lead salts, and as a brightener agent, an effective amount of

(a) at least one alkoxylated amine of the formula



(I)

wherein

R is a fatty acid alkyl group containing from about 8 to about 22 carbon atoms,

R^1 is an alkylene radical containing up to about 5 carbon atoms,

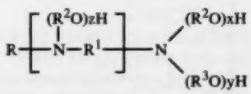
R^2 and R^3 are each independently an ethylene or propylene group, a is 0 or 1, and

x, y and z are each independently integers from 1 to about 30, and the sum of x, y and z is an integer of from about 2 to about 50., and

(b) an aromatic amine selected from the group consisting of aniline, o-toluidine, m-toluidine, p-toluidine or o-chloroaniline.

37. A brightener additive composition for aqueous acid tin, lead or tin-lead electroplating baths comprising a mixture of:

(a) at least one alkoxylated amine of the formula



wherein

R is a fatty acid alkyl group containing from about 8 to about 22 carbon atoms,

R^1 is an alkylene group containing three carbon atoms,

R^2 and R^3 are each independently an ethylene or propylene group,

a is 1, and

x, y and z are each independently integers from 1 to about 30, and the sum of x, y and z is an integer of from about 2 to about 50, and

(b) at least one aromatic aldehyde, at least one of which is a chlorobenzaldehyde.

4,135,992
ZINC ELECTROPLATING BATH

Rolf Fikentscher, Ludwigshafen; Klaus Glaser, Mutterstadt; Guenther Gotsmann, Frankenthal, and Werner Streit, Bobenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland/Pfalz, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,823

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658934

Int. Cl.[2] C25D *3/22*

U.S. Cl. 204—55 R **2 Claims**

1. An aqueous cyanide-free alkaline zinc bath for electroplating metallic surfaces with mirror-bright zinc coatings, which bath contains from 2 to 50 g/l of zinc ions, from 30 to 250 g/l of an alkali metal hydroxide and from 0.1 to 50 g/l of a polyalkylene-polyamine of the formula

$$H_2N—[(CH^2)_n—NH]_xH$$

where n is from 2 to 4 and x is from 8 to 150 and the $—(CH_2)_n—$ group may be linear or branched, the said polyalkylene-polyamine being alkylated at the basic nitrogens with from 0.1 to 2.2. moles per equivalent of nitrogen of an alkylating agent selected from the group consisting of methyl chloride, ethyl

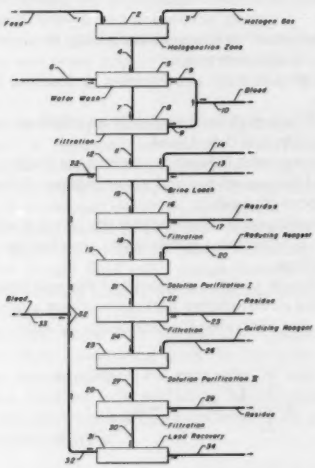
chloride, methyl bromide, ethyl bromide, methyl iodide, ethyl iodide, dimethyl sulfate and diethyl sulfate.

4,135,993

RECOVERY OF LEAD VALUES

Richard T. Um, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 15, 1977, Ser. No. 806,884
Int. Cl.[2] C01G *21/16*; C25C *3/34*
U.S. Cl. 204—66 **15 Claims**



1. In a process for the recovery of lead values from a sulfur-containing lead bearing source which comprises the steps of:
(a) halogenating said lead bearing source at an elevated temperature to form lead halide,
(b) washing the halogenated mixture,
(c) leaching the washed mixture with brine,
(d) filtering the resulting solution to separate elemental sulfur and residue from soluble lead halide, and
(e) recovering the desired lead values, the improvement which comprises treating the soluble lead halide with a reducing agent, filtering to remove insoluble residue, thereafter further treating the soluble lead halide with an oxidizing agent and metallic iron and filtering the solution to remove insoluble residue before recovering said lead values.

4,135,994

PROCESS FOR ELECTROLYTICALLY PRODUCING ALUMINUM

Tatsuo Ishikawa, Sapporo, and Hachiro Ichikawa, Shimizu, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,632
Int. Cl.[2] C25C *3/06*
U.S. Cl. 204—67 **9 Claims**

1. In a process for electrolytically producing metallic aluminum by melting and electrolyzing aluminum chloride together with an alkali metal halide in a cell lined with a refractory material and containing graphite electrodes to produce chlorine gas at the anode surface and molten aluminum at the cathode surface. the improvement wherein the electrolytic bath of a mixed molten salt consisting essentially of 2 to 15% by weight of $AlCl_3$, 15 to 70% by weight of at least one chloride selected from the group consisting of $CaCl_2$ and $MgCl_2$, provided that the amount of $CaCl_2$ does not exceed 40% by weight, and 83 to 15% by weight NaCl.

4,135,995

METHOD OF ELECTROLYSIS, AND ELECTRODE FOR THE ELECTROLYSIS

Cletus N. Welch, Clinton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 17, 1978, Ser. No. 878,630
Int. Cl.[2] C25B *1/04, 11/12*
U.S. Cl. 204—98 **19 Claims**

1. In a method of conducting electrolysis comprising passing an electrical current from an anode through an aqueous electrolyte to a cathode, the improvement wherein said cathode comprises an intercalation compound of carbon and fluorine.

4,135,996

SELECTIVE DIAPHRAGM FOR ELECTROLYSIS

Pierre Bouy, Enghien-les-Bains; Jean Bachot, Fontenay-aux-Roses, and Jean-Luc Bourgeois, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 17, 1976, Ser. No. 742,570
Claims priority, application France, Nov. 21, 1975, 75 35627
Int. Cl.[2] C25B *1/46, 13/08, 13/02*
U.S. Cl. 204—98 **15 Claims**

1. A selective diaphragm for an electrolytic cell comprising an ion-exchange, permselective, water-insoluble polymeric membrane having a microporous layer of highly homogeneous porosity intimately adherent to at least one surface of said membrane, said ion-exchange, permselective, water-insoluble polymeric membrane having ion-exchanging radicals and being selected from the class consisting of cation-exchange membranes and anion-exchange membranes and said microporous layer having pores having hydraulic diameters of between about 0.1 and 30 microns.

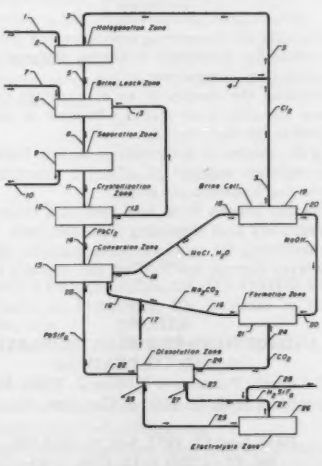
10. A method of electrolysing a sodium chloride solution, characterized in that it is conducted in an electrolytic cell equipped with anodes and cathodes and employing a selective diaphragm according to claim 1 between each anode and cathode.

4,135,997

ELECTROLYTIC PRODUCTION OF METALLIC LEAD

John C. Stauter, Streamwood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 9, 1978, Ser. No. 884,946
Int. Cl.[2] C25C *1/18*
U.S. Cl. 204—117 **9 Claims**



1. In a process for the production of lead from a lead bearing source which comprises the steps of:

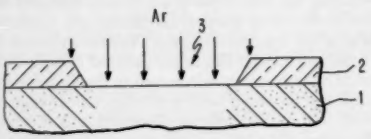
(a) subjecting said lead bearing source to an activation or drying treatment;
(b) halogenating the treated lead bearing source;
(c) leaching the halogenated lead bearing source with brine;
(d) filtering the leached solution to separate gangue from soluble lead halide;
(e) crystallizing said lead halide; and
(f) recovering metallic lead,
the improvement which comprises converting said crystallized lead halide to lead carbonate by treatment with sodium carbonate, solubilizing said lead carbonate in hydrofluosilicic acid and subjecting the resulting lead fluosilicate to electrowinning to form metallic lead.

4,135,998

METHOD FOR FORMING PT-SI SCHOTTKY BARRIER CONTACT

John J. Gniewek, Wappingers Falls; Timothy M. Reith, Poughkeepsie; Michael J. Sullivan, Red Hook, and James F. White, Newburgh, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,213
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 E **6 Claims**



1. In the sputter etching of platinum in the presence of platinum silicide the improvement comprising increasing the difference in the sputter etch rates of platinum over the silicide by sputter etching said platinum in an ambient of a rare gas containing at least 1% by volume of oxygen or nitrogen.

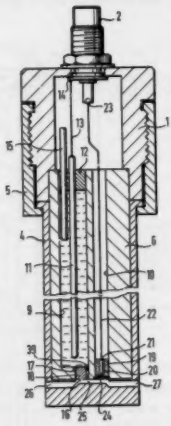
4,135,999

ION SENSITIVE ELECTRODE AND CELLS FOR USE THEREWITH

Johannes G. Schindler, and Werner Riemann, both of Marburg (Lahn), Fed. Rep. of Germany, assignors to Dr. E. Fresenius Chemisch pharmazeutische Industrie KG, Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed Jan. 26, 1976, Ser. No. 652,349
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1975, 2503176
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 M **13 Claims**

1. An ion sensitive electrode comprising:
a wire having an end face at one end thereof;
an insulating sleeve having an end face at one end thereof, said insulating sleeve surrounding said wire near the end face of said wire in a manner such that the end face of said wire is recessed from the end face of said sleeve; and



a disc directly contacting the end faces of said wire and said insulating sleeve, said disc consisting of an ion selective substance incorporated in a homogeneous polymer matrix.

4,136,000

PROCESS FOR PRODUCING IMPROVED SOLID ELECTROLYTE OXYGEN GAS SENSORS

Donald C. Davis; Donald J. Romine, both of Fostoria; Phillip R. Woodruff, Tiffin, all of Ohio; James D. Bode, Royal Oak, Mich.; Tseng Y. Tien, Ann Arbor, Mich., and Ching T. Young, Troy, Mich., assignors to Bendix Autolite Corporation, Fostoria, Ohio

Filed Mar. 13, 1978, Ser. No. 885,423
Int. Cl.[2] C23G *1/02*; G01N *27/58*
U.S. Cl. 204—195 S **21 Claims**

1. A process for producing an oxygen gas sensor element wherein the sensor element comprises a solid electrolyte body having an inner electrode of conductive catalyst material on the interior surface thereof, the exposed surface of said inner electrode being for exposure to a reference gas, and an outer electrode of conductive catalyst material on the exterior surface thereof for exposure to a gaseous mixture, the oxygen content of which is to be measured, comprising:
contacting said inner conductive catalyst with an acidic reactant selected from the group consisting of inorganic acids and acid salts to chemically activate said electrode, whereby the voltage output of the sensor element is increased and the internal resistance decreased.

8. The oxygen gas sensor element produced according to the process of claim 1.

4,136,001

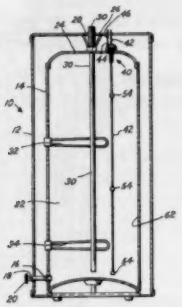
NON-SACRIFICIAL ANODE AND WATER HEATER CONSTRUCTION

Michio B. Nozaki, LaGrange, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 839,006
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—196 **18 Claims**

1. In a hot water heater comprising,
a substantially hollow metal tank having an interior surface, said tank being formed at least in part of a galvanically active material, heating means for heating water in the tank and a non-sacrificial anode means adopted to direct an electrically positive current from within said tank to said interior surface when said tank is filled with water the improvement comprising a catalyst means for catalyzing

hydrogen gas and oxygen gas formed within the tank due to electrolysis of water resulting from operation of the non-sacrificial anode means to form water molecules



within the tank, said catalyst means being disposed near the top of said tank and being chemically stable, inert, substantially water insoluble, non-toxic and harmless in contact with food stuffs.

4,136,002

DEVICE FOR ELECTROLYTICALLY APPLYING A METAL COAT ONTO A CYLINDER-SHAPED BODY

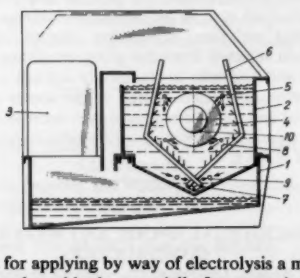
Heinrich Bober, Bern, and Othmar Hollenstein, Dietikon, both of Switzerland, assignors to Peruhag A.G., Bern, Switzerland

Filed Apr. 13, 1978, Ser. No. 895,947

Claims priority, application Switzerland, Apr. 27, 1977, 005250/77

Int. Cl.[2] **C25D** *17/06, 21/00, 21/10*

U.S. Cl. 204—225 **4 Claims**



1. A device for applying by way of electrolysis a metal coat onto a cylinder-shaped body, especially for coppering a cylinder, with an outer tank and a process tank arranged above this outer tank, as well as with a circulation and filtering apparatus for the electrolyte, characterized in that two anode supports adjustable shear-joint-type for the purpose of maintaining the distance with regard to cylinders of various diameters are installed in the process tank and connected to spray pipes, which supports are controlled by adjusting means arranged above the process tank, and in that the process tank is designed at its longitudinal ends with pockets whose inner walls are fitted with self-acting sealing elements for the projecting shaft ends of the cylinder.

4,136,003

CELL FOR FUSED-SALT ELECTROLYSIS WITH GAS COLLECTING MEANS

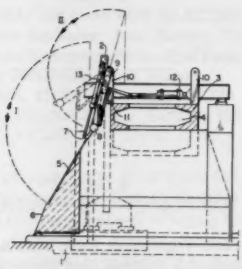
Tomas Arnason, Essen, and Rudolf Blaska, Bottrop, both of Germany, assignors to Swiss Aluminum Ltd., Neuhausen am Rhienfall, Switzerland

Continuation-in-part of Ser. No. 838,431, Sep. 30, 1977, abandoned, which is a continuation of Ser. No. 645,115, Dec. 29, 1975, abandoned. This application Apr. 7, 1978, Ser. No. 894,310

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1975, 2510400

Int. Cl.[2] **C25C** *3/06, 3/22*

U.S. Cl. 204—247 **9 Claims**



1. A cell for fused-salt electrolysis for reducing alumina in the presence of cryolite to metallic aluminum, comprising an insulated tank having a carbon bottom, an anode carrier arranged in the longitudinal center plane and movable downwardly during use, two rows of anode rods disposed on opposite sides of the anode carrier, an exhaust-gas collecting duct extending in the longitudinal center between the two rows of anode rods, and a plate-like cover inclined downwardly from the outside of each row of anode rods to the longitudinal edges of the tank and provided both at its longitudinal edge adjacent to the tank and at its transverse edges with a skirt extending as far as the edge of the tank, a support extending along the rows of anode rods, bearing brackets mounted on the anode carrier and carrying arms pivotally mounted on the bearing brackets, wherein the cover extends at an inclination to the cathode tank on the longitudinal sides of the anode carrier and comprises two parts, a lower pivotable part, hinged on at least a portion of its longitudinal edge portion adjacent to the anode rods to the support which is rigidly connected at least in its end portions to the carrying arms and a second cover part disposed between the support and the anode carrier and abutting the anode carrier.

4,136,004

SOLID ELECTRODE ELECTROLYZER FOR ELECTROLYSIS OF AQUEOUS SOLUTIONS

Georgy M. Kamarian, Kotelnicheskaya naberezhnaya, 25/8, kv. 45; Leonid A. Kostandov, Vorobievskoe shosse, 6, kv. 4, and Vladimir M. Zimin, 10 proezd Mariinoi roschi, 13, kv. 251, all of Moscow, U.S.S.R.

Filed Jul. 9, 1976, Ser. No. 703,922

Claims priority, application U.S.S.R., Jul. 15, 1975, 2155302

Int. Cl.[2] **C25B** *1/16, 1/26, 9/00*

U.S. Cl. 204—256 **18 Claims**

1. An electrolytic cell, suitable for electrolysis at elevated pressures, comprising:

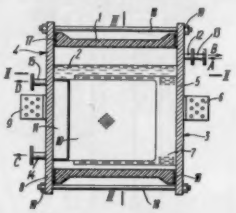
(a) a uniform horizontally disposed cylindrical cell casing made from a corrosion-resistant non-conducting material having opposite and substantially parallel ends having a first opening at one end of said cell casing and a second opening at the opposite end of said cell casing;

(b) an electroconductive monopolar electrode-cathode plate sealingly attached to said cell casing to withstand leakage at elevated pressure and covering said first opening, said

cathode plate having a plurality of cathode members attached to the inner surface of said cathode plate, and a base for said cathode with feeding busbars connected to the outer side of said cathode base, said cathode members being secured to the inner side of said base so that a common cathode space is formed between said cathode base and said cathode members;

(c) an electroconductive monopolar electrode-anode plate sealingly attached to said cell casing to withstand leakage at elevated pressure and covering said second opening, said anode plate having a plurality of anode members attached to the inner surface of said anode plate, and a base for said anode with feeding busbars connected to the outer side of said anode base;

(d) at least one bipolar electrode positioned between said monopolar electrodes, internally attached within said



cylindrical cell casing and whose current distributing base has a shape corresponding to the cross-section of said cylindrical cell casing and its diameter being slightly less than the inner diameter of said cylindrical cell casing with anode members secured on one side of the current distributing base of said bipolar electrode and cathode members secured on the opposite side of said current distributing base of said bipolar electrode so that a common space is formed between said cathode members and said bipolar electrode base;

(e) said current distributing base of said bipolar electrode containing an opening above the common cathode space;

(f) a membrane positioned between said anode and cathode members of said electrodes;

(g) an electrolyte supplying device;

(h) a chlorine tapping device; and

(i) an alkali and hydrogen tapping device.

4,136,005

ELECTROLYTIC CHLORINATOR

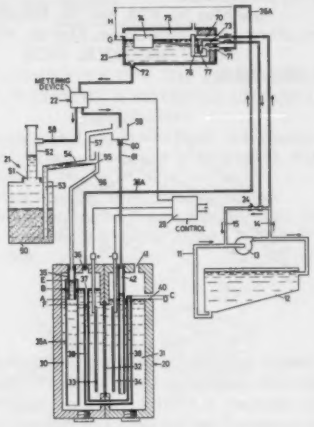
Leif Persson; Bonde Hansen, both of Malmö, Sweden, and Erik Eklund, Marbella, Spain, assignors to AG Licento, Switzerland

Filed Aug. 29, 1977, Ser. No. 828,887
Claims priority, application Sweden, Sep. 6, 1976, 7609801
Int. Cl.[2] C25B 9/00
U.S. Cl. 204—266 **10 Claims**

1. Device for chlorinating water, comprising

(a) an electrolytic cell including (1) means defining an anode compartment having a brine inlet and a chlorine gas outlet and a cathode compartment having a catholyte overflow outlet vented to the atmosphere, (2) a substantially vertical membrane permeable substantially only to cations and forming a barrier between the anode and cathode compartments, and (3) means defining a liquid trap passage extending between the anode and cathode compartments and communicating with the cathode compartment at a first overflow and with the anode compartment at a second overflow defining a maximum anolyte level, the level of at least one of said overflows being sufficiently high above the level of said catholyte overflow outlet to prevent liquid in the cathode compartment from flowing through the liquid trap passage into the anode compartment,

(b) a brine source having a chloride container for accommodating a charge of an electrolyzable chloride compound in solid form, means for controlling a supply of water to the chloride container for forming brine therein, and brine feed means for feeding brine to the brine inlet of the electrolytic cell, and



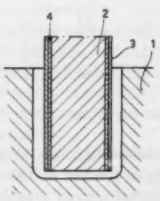
(c) a chlorine-water mixer having a chlorine intake connected to the chlorine outlet of the electrolytic cell and an inlet and an outlet for a stream of water to be chlorinated, said chlorine intake communicating with said outlet.

4,136,006

ELECTRODE FOR ELECTROCHEMICAL MACHINING

Gerrit Verspui, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,676
Claims priority, application Netherlands, Oct. 20, 1976, 7611566
Int. Cl.[2] C25D 17/10; B23P 1/02
U.S. Cl. 204—290 F **8 Claims**



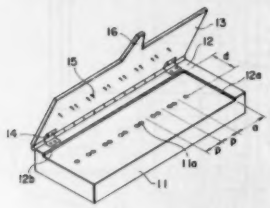
1. An electrode for the electrochemical machining of electrically conductive workpieces in an electrolyte solution comprising, an electrically conductive member having a coefficient of linear expansion similar to that of silicon carbide, said member being covered locally with an insulating layer of polycrystalline silicon carbide, an intermediate layer being present between said member and said insulating layer in a thickness of at most 0.5 μm and comprising an inorganic insulator having a resistivity of at least 10^6 Ohm.cm.

4,136,007

SAMPLE APPLYING POSITION MARKING DEVICE FOR FILM FOR ELECTROPHORESIS

Ryo Fujimori, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,681
Claims priority, application Japan, May 21, 1977, 52/59185
Int. Cl.[2] G01N *27/26, 27/28*
U.S. Cl. 204—299 R 7 Claims



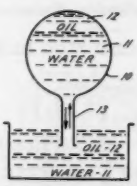
1. A sample applying position marking device for film for electrophoresis comprising a base having reference surfaces, a top plate arranged to move upward and downward on said base and to contact the top surface of said base when said top plate is moved downward, and pointed protuberances mounted to pre-determined positions on the surface of said top plate which contacts the top surface of said base when said top plate is moved downward, said sample applying position marking device for film for electrophoresis being arranged to form marks onto a film by placing the film on said base matching the film to said reference surfaces and by moving said top plate downward.

4,136,008

OCEAN OIL SKIMMER FOR CONTINUOUS REMOVAL OF OIL FROM THE OPEN SEA METHOD

Ivo C. Pogonowski, Blacksburg, Va., and Joe R. Fowler, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 482,289, Jun. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 346,542, Mar. 30, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,087
Int. Cl.[2] C02B *9/02*
U.S. Cl. 210—83 3 Claims



1. A method for continuously removing a lighter-than-water medium from floating on a water surface comprising the steps of,

(a) filling a tank with water,

(b) positioning the tank at an elevation greater than the lighter-than-water medium,

(c) interconnecting the tank of water with the lighter-than-water medium by extending a conduit from the bottom of the elevated full tank of water down into the polluting medium above the interface between the polluting medium and the water,

(d) establishing a continuous exchange of the lighter-than-water medium for the water in the tank by continuous gravity flow of both of the medium and the water through the interconnection in opposite directions simultaneously, and

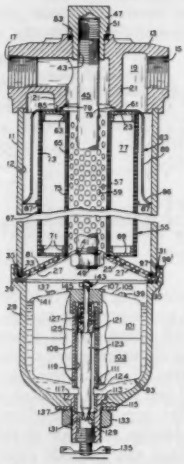
(e) lowering the conduit lower end to slightly below the interface for continued replacement of the water in the tank with the lighter-than-water polluting medium from below.

4,136,009

ADJUSTABLE FLOAT AND FILTER ASSEMBLY

David Samiran, 148 Northwest Rd., Westfield, Mass. 01085

Filed Nov. 17, 1977, Ser. No. 852,515
Int. Cl.[2] B01D *29/36*
U.S. Cl. 210—114 10 Claims



1. A filter removing liquid and solid contaminate from a fluid comprising, in combination, an elongated filter housing provided with a head portion having an inlet and an outlet disposed therein, said head portion having a downwardly directed circular partition with an opening communicating with the outlet, a filter element, means for supporting a said filter element within the housing a deflector plate mounted within the filter housing and positioned between the inlet and filter element for directing the incoming liquid toward the inside wall of the filter housing, said partition having a circular locator element for positioning the deflector plate with respect to the filter element, a float housing connected to the lower portion of the filter housing, said float housing having a drain opening in the lower portion thereof, an adjustable float for controlling the draining of the liquid removed from the fluid, said float being hollow and having a liquid inlet and a vent means for controlling the liquid inlet and vent, said float having a top dome portion whereby the float can be adjusted to the specific gravity of the liquid by filling part of the float with liquid so that the dome of the float has buoyancy in the liquid, a needle valve carried by said float, a valve bushing having a valve seat mounted in the opening of said float housing, said valve bushing adapted to support said needle valve and float within the float housing.

4,136,010

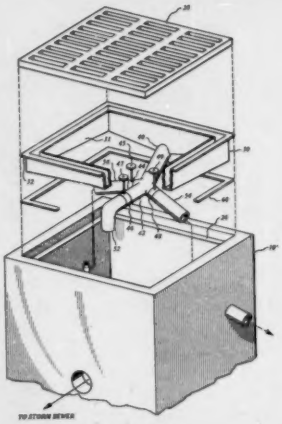
CATCH BASIN INTERCEPTOR

Roland J. Pilié, Williamsville, and Douglas B. Dahm, Lake View, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed Apr. 5, 1978, Ser. No. 893,905
Int. Cl.[2] E03F *5/06, 5/14*
U.S. Cl. 210—164 7 Claims

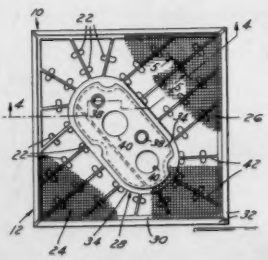
5. A system for reducing the amount of pollutants entering a storm sewer including:

a storm sewer system;
a plurality of catch basins operatively connected to said storm sewer system and each having ledge structure on at least two opposing sides and a grate adapted to seat on said ledge structure;
a receiver system;
each catch basin having:
(a) an open, sloping trough having an outlet proximating the lowest point of the trough and a peripheral lip



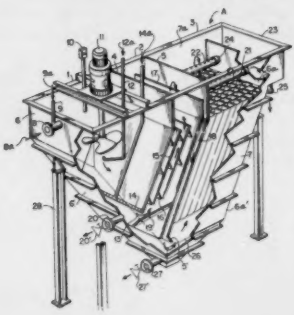
adapted to seat on the ledge structure of the catch basin and to be held in place by the grate;
(b) a fluid line connecting said outlet to said receiver system; and
(c) a valve in the fluid line intermediate the outlet and the receiver system, whereby when the valve is open, run-off water and spills flowing into the catch basin are intercepted by the trough and flow through the outlet into said receiver system, and flow into said storm sewer only when said trough overflows.

4,136,011
TRANSMISSION FLUID FILTER AND METHOD FOR MANUFACTURE THEREOF
A. David Joseph, North Muskegon, Mich., and Elmer E. Ward, Lake Forest, Ill., assignors to Sealed Power Corporation, Muskegon, Mich.
Filed Nov. 23, 1977, Ser. No. 854,385
Int. Cl.[2] F01M *11/00*; B01D *39/08*
U.S. Cl. 210—168 **10 Claims**



1. In a fluid filter assembly comprising a filter medium, support means for carrying said filter medium to permit passage of fluid through said filter medium into a cavity defined between said support means and said filter medium and a fluid outlet from said cavity, the improvement wherein said support means comprises a base member, and a filter support frame having a peripheral edge which cooperates with said base member to define said cavity and a plurality of support ribs extending from adjacent said fluid outlet to said peripheral edge, said filter medium being carried by said ribs in spaced relation to said base member.

4,136,012
COMPACT APPARATUS FOR THE PURIFICATION OF WASTE WATER BY A PHYSICAL CHEMICAL TREATMENT
Robert Louboutin, La Celle-Saint-Cloud, and Vincent Savall, Velizy, both of France, assignors to Degremont, Rueil-Malmaison, France
Filed Aug. 30, 1977, Ser. No. 829,095
Claims priority, application France, Sep. 17, 1976, 76 27958
Int. Cl.[2] B01D *21/08*
U.S. Cl. 210—208 **17 Claims**



1. An apparatus for the purification of waste water by a physical chemical treatment, said apparatus comprising:
a single, integrally formed tank having a lower portion of downwardly descending volume defined by a plurality of exterior walls, at least two opposite of said exterior walls being inclined downwardly and inwardly toward each other;
the interior of said tank being divided into first, second and third serially connected compartments, said first and second compartments being in communication at the bottoms thereof, and means for communicating the top of said second compartment with the bottom of said third compartment;
means for introducing waste water to be treated into the top of said first compartment, such that said waste water flows downwardly through said first compartment, then from the bottom of said first compartment into the bottom of said second compartment and upwardly through said second compartment, and then from the top of said second compartment through said communicating means into the bottom of said third compartment and upwardly through said third compartment;
a plurality of inclined plates positioned within said second compartment to define therein a plurality of upwardly inclined flow passages having bottom inlet ends in communication with the bottom of said first compartment, whereby said waste water flows through said upwardly inclined flow passages;
a plurality of deflectors extending into each of said upwardly inclined flow passages for creating turbulence in the flow of said waste water passing therethrough;
a plurality of inclined hollow tubes positioned within said third compartment and having bottom inlet ends in fluid communication with the top of said second compartment through said communicating means; and
means for collecting purified water from the top of said third

compartment, and outlet means in communication with said collecting means.

4,136,013

EMULSION CATALYST FOR HYDROGENATION PROCESSES

Norman G. Moll, Sanford, and George J. Quarderer, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 28, 1977, Ser. No. 772,874
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 **10 Claims**

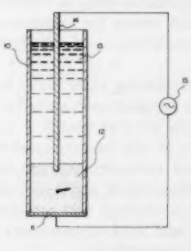
1. In the process for hydrogenating a coal slurry, the slurry comprising finely divided coal dispersed within a water-immiscible liquid phase, the process comprising contacting the slurry with hydrogen in the presence of a metal-containing hydrogenation catalyst, the improvement wherein the metal-containing catalyst is initially added to the water-immiscible liquid phase as an emulsion in the water-immiscible liquid phase of a water solution of a compound of the metal, the compound being convertible to the hydrogenation catalyst under the conditions of hydrogenation.

4,136,014

METHOD AND APPARATUS FOR SEPARATION OF BITUMEN FROM TAR SANDS

Frederick E. Vermeulen, Edmonton, and Frederick S. Chute, Sherwood Park, both of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 705,991, Jul. 16, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,169
Claims priority, application Canada, Aug. 28, 1975, 234394
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—11 LE **5 Claims**



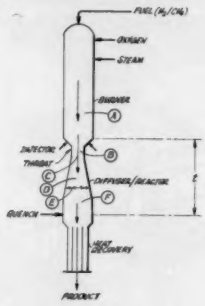
1. A method of separation of bitumen from tar sands comprising:
   (a) placing a charge of unseparated tar sand to a first level and an amount of water to a second level in a container,
   (b) applying electrical energy to the tar sand, such that an electric current passes through the tar sand and the water,
   (c) continuing the application of electrical energy until the tar sands and water have been agitated, mixed and the bitumen separated from the sand, and floated upward to the top of the water, and
   (d) removing the flotation layer for further processing, said layer containing a high proportion of the bitumen occurring in the charge of tar sand.

4,136,015

PROCESS FOR THE THERMAL CRACKING OF HYDROCARBONS

Gerard R. Kamm, South Charleston; David Milks, Charleston; James D. Kearns, Charleston; Herbert I. Britt, Charleston, and Cyrus R. Khavarian, South Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 7, 1977, Ser. No. 804,227
Int. Cl.[2] C10G *9/38*
U.S. Cl. 208—129 **5 Claims**



1. In a process for the thermal cracking of hydrocarbons by the introduction of liquid crude oil distillate feedstock in atomized form into a stream of hot combustion products formed by the combustion of fuel and oxidant in successive burner and mixing zone, constricting throat zone, a velocity acceleration diffuser zone and secondary cracking and reaction zone along the path of hot combustion product stream flow, the improvement which comprises: effecting initial mixing, vaporization and cracking of said atomized liquid petroleum feedstock in said stream of hot combustion products in said burner and mixing zone maintained at subsonic velocity flow; effecting substantially complete mixing and vaporization in said constricting throat zone wherein said stream is maintained, at exit, at sonic velocity flow; passing said stream through a velocity acceleration diffuser zone maintained at supersonic velocity flow; passing said stream through a shock region produced by cross-sectional expansion of a diffuser zone; and effecting a final thermal cracking conversion in said stream in a subsonic velocity additional cracking reaction zone before quenching of said stream.

4,136,016

HYDROCARBON CONVERSION PROCESS UTILIZING A MAGNETIC FIELD IN A FLUIDIZED BED OF CATALITIC PARTICLES

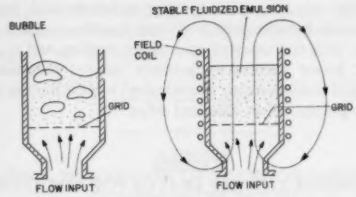
Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 786,613, Apr. 11, 1977, Pat. No. 4,115,927, which is a continuation-in-part of Ser. No. 610,071, Sep. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,003, Oct. 11, 1974, abandoned. This application Jan. 3, 1978, Ser. No. 866,780
Int. Cl.[2] C10G *23/10, 35/14*
U.S. Cl. 208—134 **6 Claims**

1. A fluidized hydrocarbon conversion process which comprises:
   (a) subjecting a fluidized bed comprised of magnetizable, fluidizable composite particles which have catalytic activity for hydrocarbon conversion and which contain 2 to 40 volume % ferro- or ferrimagnetic material to a nontime varying and substantially uniform applied magnetic field having a substantial component along the direction of gravity such that said composite particles have a component of magnetization along the direction of gravity, and
   (b) passing a fluidizing gaseous medium comprising a vapor-

ized hydrocarbon feedstock upwardly through said bed at a superficial gas velocity ranging between:

(i) at least 10% greater than the normal minimum superficial gas velocity required to fluidize the bed in the absence of said applied magnetic field; and



(ii) less than the superficial gas velocity required to cause time-varying fluctuations of pressure difference through said bed for a 0.1 to 1 second time interval during continuous fluidization in the presence of said applied magnetic field.

4,136,017

DEHYDROCYCLIZATION WITH AN ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 810,321, Jun. 27, 1977, which is a continuation-in-part of Ser. No. 713,020, Aug. 9, 1976, Pat. No. 4,036,742, which is a continuation-in-part of Ser. No. 656,925, Feb. 10, 1976, Pat. No. 4,025,418, which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,059. This application Oct. 13, 1977, Ser. No. 841,875

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **26 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, about 0.1 to about 5 wt. % cobalt, about 0.001 to about 1 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, rhenium, catalytically available cobalt and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,136,018

VORTEX SEPARATOR WITH COAXIAL INLET AND LIGHTWEIGHT REJECT PIPELINES

Llewellyn E. Clark; John B. Matthew, both of Pittsfield, and Bruce E. Nunn, Chester, all of Mass., assignors to Beloit Corporation, Beloit, Wis.

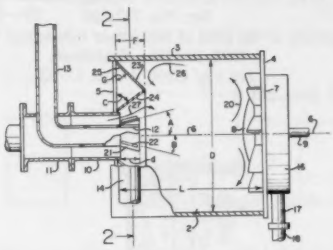
Filed Nov. 10, 1977, Ser. No. 850,366

Int. Cl.[2] B03B *5/32*

U.S. Cl. 209—13 **12 Claims**

10. A method of pulping and grading material for use in making paper or the like in a separator unit of the type having an elongated chamber defined by a cylindrical wall, a first end wall having a perforate screen and a second wall opposite said first end wall and further including one impeller only in said chamber adjacent said first wall to provide rotational movement of said material concurrently with the movement of said material radially outwardly in the area of said impeller and back toward said first wall, the improvement comprising:

removing lightweight rejects through an outlet in the center of said second end wall,



removing heavy rejects through an outlet in said cylindrical wall, passing accepts through the perforate screen and introducing said material into said chamber through an area surrounding and immediately adjacent to the opening for removing lightweight impurities.

4,136,019

PRODUCTION OF HIGH PURITY FLUORSPAR AND BARITE CONCENTRATES FROM A COMPLEX FLUORSPAR ORE

Martin Wilson, Anaheim, Calif., assignor to United States Borax & Chemical Corp., Los Angeles, Calif.

Filed Jun. 13, 1977, Ser. No. 805,778

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **14 Claims**

1. The method of beneficiating non-sulfide ores comprising subjecting an aqueous slurry of said ore to froth flotation in the presence of a fatty acid-type collector reagent and an organic CF_3-group containing compound selectivity agent, thereby depressing interfering calcium ions.

4,136,020

FLOTATION REAGENT AND PROCESS

Arthur H. Fischer, New York, N.Y., assignor to Minerec Corporation, New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,844

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **6 Claims**

5. The process for beneficiating copper sulfide ores by froth flotation in the presence of a flotation promoter to recover copper concentrate comprising:

providing an aqueous pulp of said ore;

adding as said promoter a mixture of an alkyl xanthogen formate with alkyl radicals of 1–6 carbon atoms and the reaction product of said xanthogen formate and an aromatic amine selected from the group consisting of o-toluene diamine, o-phenylene diamine, o-toluidine and o-xylidine, said amine comprisine 5 to 40 wt.% of the reaction mixture; and

recovering a copper concentrate.

4,136,021
SORBENT FOR HEAVY METALS

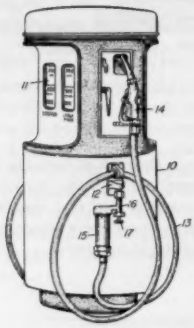
Darrell D. Whitehurst, Titusville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 512,788, Oct. 7, 1974, Pat. No. 3,994,978, which is a division of Ser. No. 387,873, Aug. 13, 1973, Pat. No. 3,875,125, which is a continuation-in-part of Ser. No. 270,913, Jul. 12, 1972, Pat. No. 3,785,968. This application Aug. 25, 1976, Ser. No. 717,720

The portion of the term of this patent subsequent to Jan. 15, 1991, has been disclaimed.

Int. Cl.[2] C10G *17/00, 17/02*

U.S. Cl. 208—251 R **2 Claims**



1. A method for effecting removal of a heavy metal contaminant from a hydrocarbon solution containing same which comprises contacting said solution, with a sorbent for said metal contaminant comprising a cross-linked polystyrene resin modified by the presence therein of chemically bound sulfur having an oxidation state of less than +6.

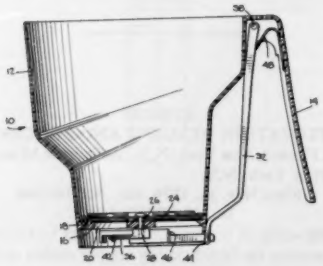
4,136,022
NESTABLE SIFTER

Lawrence R. Hutzler, Long Beach, N.Y., and Falle Uldall, Roskilde, Denmark, assignors to Hutzler Manufacturing Company, Inc., Canaan, Conn.

Continuation of Ser. No. 662,044, Feb. 27, 1976, abandoned. This application Feb. 10, 1978, Ser. No. 876,705

Int. Cl.[2] B07B *1/02*

U.S. Cl. 209—357 **13 Claims**



1. A sifter for sifting granular or powdered material such as flour comprising a hollow body member formed with a first opening defining a bottom end and a second opening defining a top end, said body member including an upper portion which tapers inwardly toward the bottom end, a lower portion which also tapers inwardly to the bottom end and means interconnected between said upper and lower portions for sharply reducing the cross-sectional area defined by said body member between said portions and thereby interrupting any continuity of inward taper between said upper and lower portions, a screen positioned within said lower portion near the bottom end, an agitator positioned within said lower portion above said screen, a handle member connected at one end to the outer surface of said upper portion near the top end, the other end of said handle member being spaced from said body member, and actuating means connected to one of said members and to said agitator for actuating said agitator, wherein said actuating means extends between said body and handle members and in alignment with the taper of said upper portion and is spaced from said lower portion to facilitate manual actuation, and wherein said body member is contoured to nest therein at least the lower portion of an identical sifter.

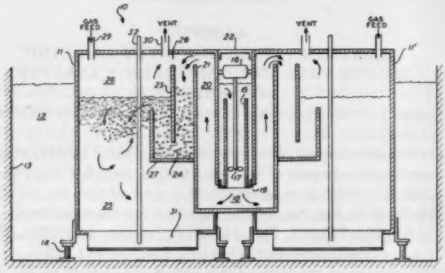
4,136,023
METHODS AND APPARATUS FOR TREATING WASTEWATER

Bradley S. Kirk, Plainfield, and Raymond M. Chappel, Mendham, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 413,409, Nov. 6, 1973, abandoned. This application Jul. 8, 1975, Ser. No. 594,408

Int. Cl.[2] C02C *1/08, 5/04; C02B 3/08*

U.S. Cl. 210—7 **16 Claims**



1. A method of oxygenating a body of wastewater containing organic solids and comprising the steps of:

providing a generally enclosed chamber having an inlet, an outlet, and a static mixing zone intermediate said inlet and outlet;

admitting at least a portion of said body of wastewater into said chamber through said inlet;

passing said admitted wastewater to said static mixing zone;

introducing an oxygenating gas into said static mixing zone and oxygenating said admitted wastewater by dissolving at least a portion of the oxygen in said gas in said admitted wastewater;

collecting undissolved oxygen entrained in said wastewater subsequent to the passage of wastewater through said static mixing zone;

recirculating said collected oxygen to said static mixing zone for further dissolution in wastewater therein, and

emitting said oxygenated wastewater from said chamber through an adjustable nozzle at the outlet of said chamber and controlling the opening and directionality of said nozzle to mix said oxygenated wastewater with said body of wastewater such that said organic solids in said body of wastewater are maintained in suspension.

11. Apparatus for oxygenating a body of wastewater containing organic solids comprising a generally enclosed oxygenating chamber emplaceable in said body of wastewater; means for pumping wastewater under treatment into said chamber; means for introducing an oxygenating gas into said chamber to form a gas space therein containing said oxygenating gas; means for rendering said pumped wastewater turbulent by subjecting said pumped wastewater to a gravitational fall over a weir through said oxygenating gas and into a gravitational fall zone substantially defined by said weir and by baffle means spaced therefrom with the resulting liquid-gas turbulence in said fall zone being effective to oxygenate said turbulent waste-

water and entrain undissolved oxygenating gas therein; liquid accumulation means for receiving oxygenated wastewater from said fall zone and for dissipating said turbulence to enable disentrainment and recovery within said chamber of said undissolved entrained oxygenating gas; and nozzle means for discharging said oxygenated wastewater from said liquid accumulation means into said body of wastewater at a velocity such that said body of wastewater is sufficiently stirred to maintain said organic solids suspended therein.

4,136,024

AEROSOL DISPERSION OF MICROORGANISMS TO ELIMINATE OIL SLICKS

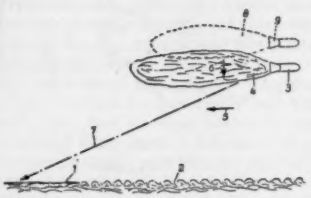
Karl Bisa, and Thomas Bisa, both of Am Wilzenberg 32, 5949 Grafschaft, Germany

Continuation-in-part of Ser. No. 723,622, Sep. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,547, May 29, 1975, abandoned. This application Jan. 24, 1978, Ser. No. 871,788

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1975, 2506612

Int. Cl.[2] C02C *1/02, 5/10*

U.S. Cl. 210—11 **20 Claims**



1. A method for the reduction or elimination of hydrocarbon contamination from an area on the surface of the earth which comprises selecting a bacterial microorganism or mixture of microorganisms from a known group having the property of degrading the hydrocarbon contaminating the surface area, selecting a growth culture medium therefor and forming at least one liberated heavier than air aerosol cloud containing a combination of said selected microorganism or microorganisms and said selected growth culture medium, both in fine particulate state, in the atmosphere above said area of hydrocarbon contamination in such calculated position that the cloud settles gradually over a predetermined time toward and onto said area, said predetermined time being sufficient so that a substantial increase in the number of microorganisms occurs before said cloud settles on said area.

4,136,025

METHOD OF CLEANING MEMBRANE FILTER

Robert R. Zwack, New Kensington, and Roger M. Christenson, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1977, Ser. No. 825,735

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **7 Claims**

1. A method of cleaning a membrane which has been used for filtering under pressure a cataphoretic paint containing lead and which has been fouled by said paint, said method comprising:

(A) treating said membrane with an aqueous solution of an acid which forms a water-soluble lead salt, and a water-soluble organic solvent.

4,136,026

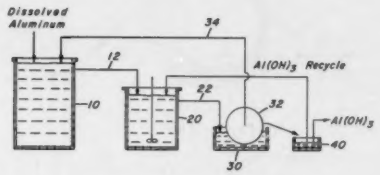
CAUSTIC SOLUTION HAVING CONTROLLED DISSOLVED ALUMINUM CONTENT

Raymond J. Meyer, Apollo; Wayne F. Johnson, Lower Burrell, and Richard A. Wodehouse, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 23, 1977, Ser. No. 854,271

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—45 **16 Claims**



1. A method of greatly extending the useful life of a caustic solution for etching aluminum by controlling the dissolved aluminum content of the caustic solution comprising the steps of:

(a) providing a tank of etching solution containing sodium hydroxide, the balance comprising water;

(b) etching aluminum in the etch solution thereby dissolving aluminum therein;

(c) introducing a portion of the etch solution containing the dissolved aluminum to a reactor for purposes of lowering the aluminum content thereof;

(d) treating the etch solution in the reactor with aluminum hydroxide to lower the dissolved aluminum content thereof by causing said dissolved aluminum to precipitate as aluminum hydroxide, aluminum hydroxide being maintained in the reactor in the range of 30 to 600 gms/liter of solution, the treatment capable of causing the dissolved aluminum to precipitate from the etch solution at a rate substantially commensurate with the rate of introducing aluminum during etching and capable of being effective when the solution has a mean residence time of less than 5 hours in the reactor;

(e) removing a portion of the etch solution and aluminum hydroxide from the reactor on a substantially continuous basis, the aluminum hydroxide being separated from the etch solution to an extent which prevents precipitation of dissolved aluminum in the etching tank, the solution being removed from the reactor at a rate substantially commensurate with the rate at which it is introduced in step (c); and

(f) recirculating the portion of solution to the etch tank thereby controlling the dissolved aluminum content of the etching solution.

4,136,027

METHOD FOR TREATING WATER

Yusuke Sakamoto; Munetaka Kinugasa, both of Osaka; Shigeki Endo, Sakai; Mituo Yamane, Osaka, and Shigeyoshi Fujie, Kishiwada, all of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Continuation of Ser. No. 628,317, Nov. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 581,279, May 27, 1975, abandoned, which is a continuation of Ser. No. 398,796, Sep. 19, 1973, abandoned. This application Jun. 1, 1977, Ser. No. 802,541

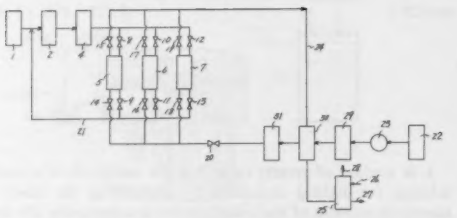
Claims priority, application Japan, Sep. 22, 1972, 47-95706

Int. Cl.[2] C02B *1/38*

U.S. Cl. 210—63 Z **1 Claim**

1. In a method of treating water with ozone comprising generating ozone from oxygen by an ozone generator, supplying the resulting ozone-containing gas to at least three silica gel-packed adsorption towers one after another to cause the silica gel to adsorb ozone selectively from the gas while recy-

cling discharged gas from the adsorption tower to the ozone generator, supplying a carrier gas for desirbing the ozone from the silica gel to the adsorbed ozone-containing adsorption towers one after another and contacting the ozone-containing carrier gas discharged from the adsorption towers with the water in the water treating tank so as to cause the ozone to react with the water, an improvement which comprises (i) switching the supply of carrier gas to the adsorption towers one after another from one to another when or immediately before or immediately after the ozone concentration in the



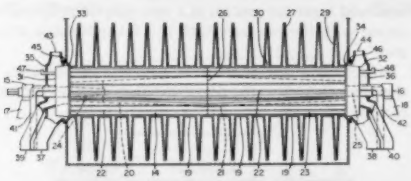
carrier gas discharged from the adsorption tower starts to decrease so as to keep the water treating ability as constant as possible with a substantially constant ozone concentration and (ii) introducing oxygen into the adsorption towers to which the supply of carrier gas has been terminated one after another from one of the towers which has completed adsorption so as to purge away the carrier gas containing ozone from the adsorption tower and from a line extending therefrom into a water treating tank without venting the same to the atmosphere and so as to avoid the accumulation of impurities in the recycling gas and the contamination of the atmosphere.

4,136,028

METHOD FOR FILTERING A FIBROUS MATERIAL BY MEANS OF A DISC FILTER AS WELL AS A DISC FILTER FOR PERFORMING THE METHOD

Martti Toivonen, Rauma, Finland, assignor to Rauma-Rapola Oy, Finland

Filed Sep. 8, 1977, Ser. No. 831,389
Claims priority, application Finland, Sep. 13, 1976, 762626
Int. Cl.[2] B01D *33/08*
U.S. Cl. 210—73 R **12 Claims**



1. A method for filtering a fibrous material by means of a disc filter comprising the steps of:

rotating about a substantially horizontal axis, an axle having a plurality of longitudinal compartments therein and at least one filter disc sector associated with each compartment;

passing said compartments through a first vacuum zone as said compartments approach the lowest point in their path of rotation, to draw turbid filtrate through at least one of said disc sectors;

discharging said turbid filter from the filter through a first discharge conduit;

passing said compartments through a second vacuum zone as said compartments pass through the first 60° of upward movement in their path of rotation, to draw relatively clear filtrate through at least one of said disc sectors;

discharging said relatively clear filtrate from the filter through a second discharge conduit; and

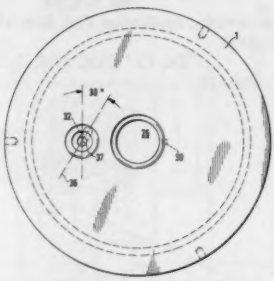
removing the vacuum from said compartments at a point along the path of rotation of said compartments, to permit unfiltered material to be discharged from the filter.

4,136,029

PRESSURE FILTRATION DEVICE

Klaus Cosack; Wolfgang Hein, and Manfred Neumann, all of Dassel, Fed. Rep. of Germany, assignors to Carl Schleicher & Schull, Einbeck, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,738
Int. Cl.[2] B01D *25/00*
U.S. Cl. 210—242 R **12 Claims**

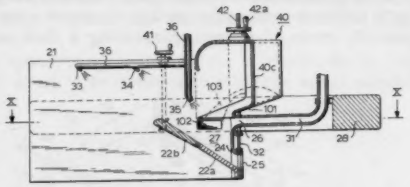


1. In a pressure filtration apparatus of flat construction suitable for operation in a horizontal position and having means for forcibly conducting the inflow stream over the surface of a filter, said apparatus comprising an upper portion with an inflow channel and a discharge channel for the concentrate and a lower portion with a filter support and a discharge channel for the filtrate, the upper portion and the lower portion being releaseably connectable with one another while forming a pressure space, the improvement comprising a distributor plate whose underside is disposed parallel to the upper side of the filter and snugly above the latter while forming an intervening space and in the center of which the concentrate discharge channel opens, the outer edge of the distributor plate forming a small annular space which extends around and closely against a basically vertical interior of the pressure space, the top side of the distributor plate having a peripherally raised outer edge which while forming a narrow annular clearance extends to close up against a downwardly pointing horizontal wall of the upper portion, has an annular distributor ring surface which grows steadily deeper from the outer edge toward the center of the distributor plate and in the center has a short connecting bushing by way of which the distributor plate is secured to the upper portion and through which the discharge channel for the concentrate runs, and an inflow channel having an opening which opens up in the upper portion in the region of the deepest point of the distributor ring surface above the latter and, at least along a length disposed in front of the opening and determining the direction of flow of the emerging inflow current, slopes toward the horizontal at an angle thereto and relative to the vertical projection of its axis runs basically tangentially to the vertical projection of the distributor ring, such that the inflow channel and the distributor plate cooperate to provide an inflow current which impinges basically tangentially to the connecting bushing in the center of the distributor plate.

4,136,030
APPARATUS FOR COLLECTING EFFLUENT OIL

Yajuro Seike; Yoshikuni Matsuo; Masaru Nakashima; Toshikazu Shojima, and Shinohara Masaaki, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1978, Ser. No. 879,108
Claims priority, application Japan, Feb. 21, 1977, 52-17088
Int. Cl.[2] B01D *37/00;* **E02B** *15/04*
U.S. Cl. 210—242 S **1 Claim**



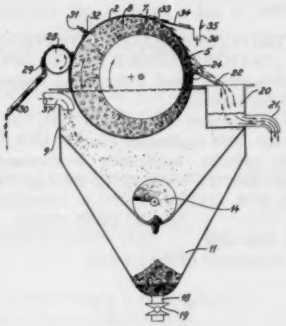
1. An apparatus for collecting effluent oil including a pair of left and right side plates disposed at a predetermined distance in a forwardly opened arrangement, a weir plate mounted to said side plates as inclined in a rear-downward direction so that its opposite side edges may contact with the inner wall surfaces of said respective side plates under a water surface, a slant plate disposed with its rear end positioned above the rear end of said weir plate at the rear ends of said side plates and having its opposite side edges fixedly secured to the inner wall surfaces of said side plates, an oil leakage preventing plate positioned in the midway between the rear end of said weir plate and the rear end of said slant plate and having its opposite side edges fixedly secured to the inner wall surfaces of said side plates to form a water discharge port between said oil leakage preventing plate and the rear end of said weir plate and to form an oily water intake port between said oil leakage preventing plate and the rear end of said slant plate, an oily water intake pipe communicated with said oily water intake port, a pair of left and right wave buffer chambers which are of substantially cylindrical shape having their top and bottom ends closed and having their side walls partly cut away, and float means mounted to said side plates; characterized in that said slant plate is appropriately inclined in an obliquely rear-upward direction with its rear end extended into said wave buffer chambers, and that between said wave buffer chambers and an oil pool formed as delimited by said side plates, weir plate and oil leakage preventing plate, is provided a water conduit path for communicating therebetween.

4,136,031
APPARATUS FOR THE RECOVERY OF LIQUID FROM A LIQUID MEDIUM CONTAINING SOLIDS

Ole M. Jakobsen, Roskilde, Denmark, assignor to A/S Kobenhavns Pektinfabrik, Lille Skensved, Denmark

Filed Jan. 31, 1977, Ser. No. 764,236
Claims priority, application Denmark, Jan. 30, 1976, 407/76
Int. Cl.[2] B01D *15/02, 33/16*
U.S. Cl. 210—267 **12 Claims**

1. An apparatus for the recovery of liquid from a liquid medium containing solids, comprising a container, an inlet for supplying liquid medium to said container, a rotatable outer drum having a drum wall capable of filtering said solids and containing loose, compressible, resilient, liquid-absorbing material, a rotatable inner drum having a liquid impervious drum wall and being mounted for rotation within and eccentrically relative to said outer drum, said inner drum forming with said outer drum a compression zone for compressing said liquid-absorbing material and for passing said liquid through said outer drum, and a pressure relief zone for expanding said liquid-absorbing material and for absorbing liquid passing through said outer drum from said container, driving means for rotating the outer and inner drums in the same direction into the liquid medium within said container, transporting means located within a zone defined between the interior surface of said outer drum and the exterior surface of said inner drum and rotatable with said drums for transporting liquid-absorbing material through said compression zone and subsequently through said pressure-relief zone, solids removal means con-

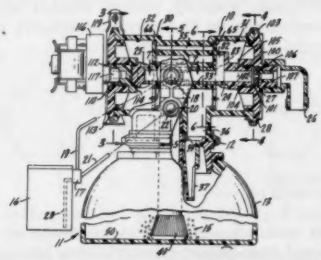


tacting the exterior surface of said outer drum to remove solids deposited thereon, said means being located between said pressure-relief zone and said compression zone, means for collecting liquid removed from said liquid-absorbing material in said compression zone and an outlet for discharging the collected liquid.

4,136,032
LIQUID TREATMENT APPARATUS

Daniel A. Bakken, White Bear Lake; Robert A. Henderson, Rosemount, and Edward J. Tischler, St. Paul, all of Minn., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed Dec. 23, 1977, Ser. No. 864,063
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—278 **19 Claims**



1. Multiple cycle liquid treatment apparatus comprising:
(a) a container enclosing a liquid treating material;
(b) a liquid flow changing control valve connected to said container, comprising a housing having a first circular cavity with an untreated liquid inlet port at one of its ends and a second circular cavity with a treated liquid outlet port at its other end, said cavities being axially aligned, a channel connecting the center of each cavity and a passage spaced radially outwardly from said channel also connecting said cavities, first and second holes in said housing respectively connecting said first and second cavities to the inside of said container;
(c) a pair of separate, rotatable, slotted, circular discs, a first one of which is sealed against a surface of said first cavity, and a second one of which is sealed against a corresponding surface of said second cavity, and coupling means

comprising hollow tubular means passing through said channel and connecting said discs to each other; and

(d) timer controlled means for rotating said discs in unison so as to selectively align various slots in each disc with or to block said cavities, channel, passage and holes for varying time periods during which the direction of liquid flow in said apparatus is changed and controlled.

4,136,033

6-HYDROXYPYRIDONE-2 COMPOUNDS HAVING A CATIONIC GROUP IN THE 3-POSITION

Willy Steinemann, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

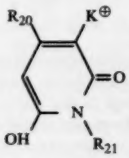
Continuation-in-part of Ser. No. 87,602, Nov. 6, 1970, Pat. No. 3,852,261. This application Jun. 25, 1974, Ser. No. 483,041

Claims priority, application Switzerland, Nov. 7, 1969, 16561/69; Dec. 23, 1969, 19042/69; Aug. 13, 1970, 12175/70; Aug. 18, 1970, 12339/70

Int. Cl.² C07D *401/02*

U.S. Cl. 546—258 **27 Claims**

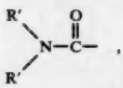
1. A compound of the formula



wherein

K ⊕ is pyridinium, quinolinum, isoquinolinium, quinoxalinium, thiazolium, pyrimidinium, imidazolium, pyrazinium, benzoimidazolium, benzotriazolium, benzothiazolium, triazolium, tetrazolium, thiadiazolium, isoindazolium or 3-oxopyrazolinium, or a substituted derivative thereof wherein each substituent of each substituted derivative is independently lower alkyl, lower alkoxy, chloro, bromo, cyano, lower hydroxyalkyl, benzyl, phenyl or dilower alkylcarbamoyl,

R_{20} is hydrogen, lower alkyl, lower alkyl monosubstituted by lower alkoxy, lower alkoxycarbonyl, lower alkylsulfonyl, cyano, phenoxy, phenyl, dilower alkylcarbamoyl, phenylcarbamoyl or pyrrolidinocarbonyl, phenyl, furyl, pyridyl, lower alkoxycarbonyl or



wherein each of

R_{14} and R_{15} is independently hydrogen, alkyl of 1 to 6 carbon atoms, lower alkyl monosubstituted by hydroxy, phenyl, lower alkoxycarbonyl, lower alkoxy, cyano, morpholino, piperazino, tetrahydrofuryl or dilower alkylamino, phenyl, tolyl or lower alkoxy, or

R_{14} and R_{15} taken together and with the nitrogen atom to which they are joined are pyrrolidino, N′-lower hydroxyalkylpiperazino, hydrazino, N′ -lower hydroxyalkylhydrazino or N′,N′ -dilower hydroxyalkylhydrazino,

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4,136,034

LOW PRESSURE HIGH VOLUME FILTER APPARATUS

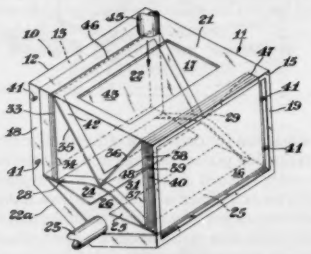
Sandor Grosshandler, Middleburg Heights, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 25, 1977, Ser. No. 854,932

Int. Cl.² B01D *25/02, 29/02*

U.S. Cl. 210—346 **4 Claims**

1. A filter assembly, the filter assembly comprising a hollow housing of generally rectangular configuration, the housing having a first open end and a second open end, the housing defining a generally rectangular channel extending from the first end to the second end, the housing defining a generally upward facing fluid receiving opening in full communication with the generally rectangular passage, the housing defining a bottom, a discharge means disposed in said bottom, first and second guide means disposed within the housing and extending generally from the first end to the second end, the guide means being positioned generally adjacent the bottom of the housing and projecting inwardly into the generally rectangular passage, the guide means supporting a plurality of filter panels of a generally rectangular configuration, the panels being a sliding fit within the rectangular passage, the panels comprising a generally rectangular frame surrounding a fluid-permeable



filter membrane, adjacent panels being alternately joined at an upper hinge line and a lower hinge line, both hinge lines extending transversely in the rectangular passage in such a manner that the upper hinge line is disposed adjacent the top of the housing and the lower hinge line being disposed generally adjacent the bottom of the housing, a plurality of generally fluid-impermeable sheet-like members pivotally affixed between adjacent filter panels at the upper hinge lines thereby providing a high volume low pressure drop filter element wherein pairs of filter panels joined at the lower hinge line are selectively slidably disposed beneath the liquid receiving opening in the top of the housing and serve to filter liquid passing into the liquid receiving opening flowing through the panels and out of the liquid discharge.

4,136,035

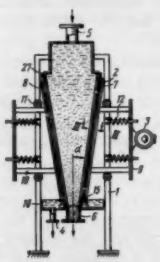
APPARATUS FOR DEHYDRATION OF CONTINUOUSLY FED FLOW OF SUSPENSION

Boris N. Bogomolov, Pervomaiskaya ulitsa, 35/18, kv. 11, Moscow; Anatoly V. Kiselev, ulitsa imeni Gazety "Krasnoyarskyrabochy", 105-a, kv. 35, and Alexandr N. Malafeev, ulitsa Akademika Pavlova, 88, kv. 8, both of Krasnoyarsk, all of U.S.S.R.

Filed Jul. 26, 1977, Ser. No. 819,138

Int. Cl.² B01D *33/00*

U.S. Cl. 210—388 **9 Claims**



1. An apparatus for dehydration of a continuously fed flow of suspension comprising: a vertical container made converg-

ing from top down; a pipe for continuously feeding a suspension to said container; an outlet of said container for discharging thickened suspension therefrom; filtering porous, frusto-conical sidewall means on said container for draining filtrate released from the suspension during its dehydration for obtaining thickened suspension; a vibrator mounted outside said container, frusto-conical vibration transmitting plane means connected to said vibrator contiguous to, parallel to, and spaced apart from said sidewall means for transmitting vibration to said filtering sidewall means during operation of the vibrator; vacuum producing means for continuously draining filtrate from between said sidewall means and said plane means.

4. An apparatus according to claim 1, wherein the filtering side wall means of the container are made of a woven material.

4,136,036

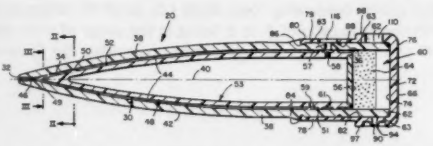
COLLECTION AND DISPENSING DEVICE FOR NON-PRESSURIZED LIQUIDS

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 674,462, Apr. 7, 1976, abandoned. This application Feb. 22, 1978, Ser. No. 879,930

Int. Cl.[2] B01D *21/26*

U.S. Cl. 210—516 **24 Claims**



1. A vented liquid collecting, separating, and dispensing device for collecting, separating and dispensing non-pressurized liquids, said device comprising

a collection compartment having an intake end, a discharge end generally opposite to said intake end, wall means connecting said ends to define with said ends the interior of said compartment, and capillary means in said compartment for drawing non-pressurized liquid into said compartment at said intake end by capillary attraction, said capillary means including a core contained within said compartment which creates a path along the compartment for capillary flow of liquid, said path having a cross-sectional area that is less than that of said compartment but greater than the area obtained by multiplying the maximum compartment dimension between said wall means by the maximum depth of sustainable capillary flow,

a dispensing chamber adjacent and in fluid communication with said discharge end,

a vent passageway extending from an inlet end adjacent to and in fluid communication with said discharge end to an outlet end on the exterior surface of the device, to exhaust air from said compartment as liquid is drawn in, and

means for displacing liquid from said capillary passageway into said dispensing chamber in response to a centrifugal force.

4,136,037

PHOSPHORAMIDE-HYDROXYMETHYL PHOSPHINE CONDENSATION PRODUCTS FOR TEXTILE FIRE RETARDATION

Destin A. LeBlanc, 115 Main St., and Robert B. LeBlanc, 99 Main St., both of Wickford, R.I. 02852

Continuation of Ser. No. 643,574, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 552,501, Feb. 24, 1975, Pat. No. 4,020,262. This application Jan. 27, 1978, Ser. No. 872,970

Int. Cl.[2] C07F *9/22*; C09K *3/28*

U.S. Cl. 252—8.1 **7 Claims**

1. A condensation product of (a) at least one hydroxymethyl phosphorus compound selected from the group consisting of $(CH_2OH)_4P$-Y and $(CH_2OH)_3P$

with (b) about 0.33 to 3 times the molar amount of at least one substituted phosphoramide of the formula

$$PO(NR^1CH_3)\ (NR^2CH_3)\ (NR^3CH_3)$$

wherein

R^1 and R^2 each independently is H or CH_2OH,

R^3 is H, CH_2OH, CH_3 or $PO(NHCH_3)_2$

Y is an equivalent amount of at least one anion of an acid.

4,136,038

FABRIC CONDITIONING COMPOSITIONS CONTAINING METHYL CELLULOSE ETHER

Hans J. Pracht, Cincinnati, and Michael E. Burns, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

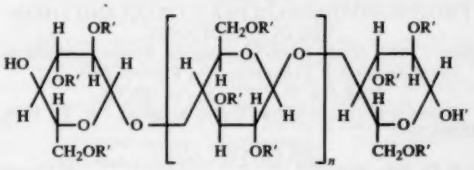
Filed Feb. 2, 1976, Ser. No. 654,432

The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.

Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.8 **10 Claims**

1. A fabric conditioning composition having the ability to impart an oily soil release benefit to fabrics contacted therewith consisting essentially of: (a) from 0.05% to 10% by weight of a methyl cellulose ether having the structure



wherein R′ is hydrogen or methyl and n ranges from 14 to 54, having a DS methyl of from 1.8 to 2.7 and a molecular weight of from 3000 to 10,000; (b) from 10% to 80% by weight of a detergency builder; and (c) the balance an inert filler.

4,136,039

BORIC ACID/AMINE REACTION PRODUCTS, THEIR MANUFACTURE AND USE

Horst Jäger, Bettingen, and Hans Wegmüller, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

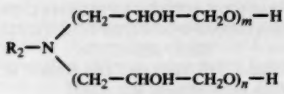
Filed Jun. 28, 1977, Ser. No. 810,837

Claims priority, application Luxembourg, Jul. 8, 1976, 75333

Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.8 **12 Claims**

1. A boric acid/amine reaction product of (a) boric acid and (b) an amine of the formula



in which R_2 is alkyl with 1 to 22 carbon atoms, phenyl, alkylphenyl with 1 to 22 carbon atoms in the alkyl radical, cyclohexyl or a heterocyclic radical with 6 ring members and 1 or 2 nitrogen or oxygen atoms as heteroatoms and m and n each denote a number from 1 to 6.

4,136,040

SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME

Donald L. DeVries, South Holland, and James M. DeJovine, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 752,225, Dec. 20, 1976, Pat. No. 4,094,799. This application Apr. 3, 1978, Ser. No. 893,101

Int. Cl.[2] C10M *1/10, 3/02, 5/02, 7/04*

U.S. Cl. 252—30 **17 Claims**

1. A composition of matter comprising a major amount by weight of oil of lubricating viscosity; a minor amount by weight of solid particles effective to improve the lubricating properties of said composition; and a minor amount by weight of at least one nitrogen-containing ester of a carboxy containing interpolymer present in an amount effective to reduce the deposit forming tendencies of said composition, said carboxy-containing interpolymer being interpolymer of α,β-unsaturated acids or anhydrides with olefins having a reduced specific viscosity of from about 0.05 to about 2, said carboxy containing interpolymer having carboxylic ester groups having at least 8 carbon atoms, and carbonyl-amino groups.

4,136,041

PHOSPHOROTHIONATE DERIVATIVES AND THEIR USE IN LUBRICANTS

Alain L. P. Lenack, Mont-Saint-Aignan, France, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

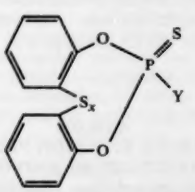
Filed Jun. 10, 1977, Ser. No. 805,328

Claims priority, application United Kingdom, Jun. 11, 1976, 24300/76

Int. Cl.[2] C07F *9/21*

U.S. Cl. 252—46.6 **10 Claims**

1. Oil soluble compounds of the general formula:



where Y is selected from the group consisting of phenoxy, alkylphenoxy and alkoxy, and x is 1 or 2; and compounds of said formula wherein either or both of the aromatic rings are substituted with an alkyl group of 2 to 25 carbon atoms.

2. A lubricating oil comprising from 99.99 to 90 wt.% of an oil and from 0.01 to 10 wt.% of a compound according to claim 1.

4,136,042

LUBRICATING OILS CONTAINING DITHIOPHOSPHORYLATED COPOLYMERS OF AZIRIDINEETHYL ACRYLATES OR METHACRYLATES AND ALKYL ACRYLATES OR METHACRYLATES

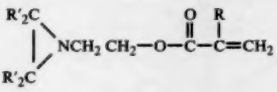
John P. Pellegrini, Jr., Pittsburgh, and Helen I. Thayer, Oakmont, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 18, 1977, Ser. No. 843,315

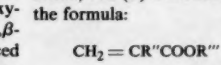
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—46.7 **18 Claims**

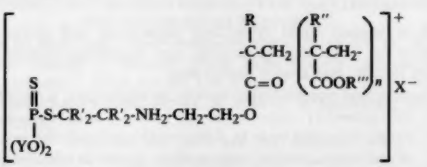
1. A lubricating oil composition which comprises a major amount of a lubricating oil and a minor amount, sufficient to improve the extreme pressure properties, of a dialkyl, diaryl, dialkaryl, diarylalkyl or diaryloxyalkyl dithiophosphorylated copolymer comprising the reaction product of (A) a monomeric aziridineethyl acrylate or methacrylate having the formula:



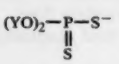
wherein R is selected from the group consisting of hydrogen and alkyl having from about 1 to about 6 carbon atoms; and each R′ are either alike or different selected from hydrogen and lower alkyl groups of from about 1 to about 8 carbon atoms; and (B) a monomeric alkyl acrylate or methacrylate of the formula:



wherein R″ is selected from the group of hydrogen and methyl, and R‴ is selected from straight and branched chain alkyl groups containing from about 1 to about 30 carbon atoms; with the mole ratio of A to B being in the range of from about 1:99 to about 30:60; said copolymer comprising the formula:



wherein R, R′, R″ and R‴ are as described above; and Y is alkyl, aryl, alkaryl, arylalkyl or aryloxyalkyl having from about 1 to about 30 carbon atoms; X^- is



wherein Y is defined above; and wherein n is an integer of from about 1 to about 300; said copolymer having a molecular weight of at least about 20,000; and from about 0.1 weight percent to about 60 weight percent comprising the dialkyl, diaryl, dialkaryl, diarylalkyl or diaryloxyalkyl dithiophosphate moiety.

4,136,043

HOMOGENEOUS COMPOSITIONS PREPARED FROM DIMERCAPTOTHIADIAZOLES

Kirk E. Davis, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 380,914, Jul. 19, 1973, abandoned, and Ser. No. 459,428, Apr. 9, 1974, abandoned. This application May 16, 1974, Ser. No. 470,483

Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—47.5 17 Claims

1. A composition obtained by preparing a mixture comprising at least one ashless dispersant soluble in a lubricating oil and at least one dimercaptothiadiazole and heating said mixture at about 100°–250° C. until it is capable of forming a homogeneous blend with an oleaginous liquid of lubricating viscosity; about 0.1–10 parts by weight of said dispersant being present per part of said dimercaptothiadiazole.

16. A composition obtained by preparing a mixture comprising:

2,5-dimercapto-1,3,4-thiadiazole;

a mineral oil; and

a dispersant which is soluble in said mineral oil and which has a base number less than 7 or an acid number when titrated to a bromphenol blue end point,

said dispersant being prepared by sequentially reacting a polyisobutenyl-substituted succinic acid in which the polyisobutenyl substituent contains at least about 50 carbon atoms with pentaerythritol and a polyethylene polyamine containing about 3–7 amino groups per molecule;

and heating said mixture at about 100°–250° C. until it forms a homogeneous blend;

about 0.1°–10 parts by weight of said dispersant being present per part of 2,5-dimercapto-1,3,4-thiadiazole.

4,136,044

LUBRICANT COMPOSITION CONTAINING ESTERS OF ARYLAMINOPHENOXYALKYL CARBOXYLIC ACIDS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 12, 1977, Ser. No. 841,259

Int. Cl.[2] C10M *1/34, 3/28;* C09K *15/18;* C07C *101/72*

U.S. Cl. 252—51.5 A 20 Claims

1. A lubricant composition comprising a major amount of a lubricating oil or grease and a minor amount sufficient to inhibit the oxidation thereof of an ester of arylaminophenoxyalkylcarboxylic acid represented by the formula:

$$(ArNAr'O(CH_2)_nCO)_mR$$

wherein:

Ar and Ar' are individually selected from the phenyl and naphthyl groups;

R is selected from the group consisting of alkyl, aryl, alkaryl, and aralkyl hydrocarbyl groups containing 1 to 20 carbon atoms in any isomeric constitution and may contain substituent groups such as alkoxy, alkoxyalkyl, acyloxy, acyloxyalkyl, and carbalkoxy;

m is a whole number within the range of 1 to 6; and

n is a whole number within the range of 1 to 12.

4,136,045

DETERGENT COMPOSITIONS CONTAINING ETHOXYLATED NONIONIC SURFACTANTS AND SILICONE CONTAINING SUDS SUPPRESSING AGENTS

Terrell W. Gault, Seattle, Wash., and Edward J. Maguire, Jr., Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 731,257, Oct. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 622,303, Oct. 14, 1975, abandoned, and Ser. No. 622,304, Oct. 14, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 841,078

Int. Cl.[2] C11D *3/20, 1/66*

U.S. Cl. 252—135 38 Claims

1. A detergent composition comprising

(A) from about 10 to about 60% of a detergent builder salt, and

(B) an intimate mixture consisting essentially of

(i) from about 0.5% to about 50% by weight of the composition of a normally solid nonionic surfactant selected from the group consisting of

(a) the condensation product of alkyl phenols with from about 5 to 20 moles of ethylene oxide;

(b) the condensation product of C_8–C_{22} aliphatic alcohols with from about 3 to 20 moles of ethylene oxide;

(c) the condensation product of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol, wherein the molecular weight of the hydrophobic portion is from about 1,500 to about 1,800;

(d) the condensation product of ethylene oxide with the product resulting from the reaction of propylene oxide and ethylene diamine, wherein the molecular weight of the hydrophobic portion is from about 2,500 to about 3,000 and the condensation product contains from about 40 to about 80% by weight of polyoxyethylene; and

(e) mixtures thereof, and

(ii) from about 0.01% to about 10% by weight of the composition of a non-self-emulsified silicone suds suppressor.

11. A detergent composition comprising

(A) from about 10% to about 60% by weight of a detergent builder salt, and

(B) an intimate mixture consisting essentially of

(i) from about 0.5% to about 50% by weight of the composition of a nonionic surfactant, and

(ii) from about 0.01% to about 10% by weight of the composition of a self-emulsified silicone suds suppressor containing a silicone suds suppressor and an emulsifier therefor selected from the group consisting of

(a) a modified polysiloxane having at least one polyoxyalkylene moiety in the polymer;

(b) a high ethoxylate of a fatty acid;

(c) zwitterionic surfactants; and

(d) mixtures thereof.

4,136,046

STORAGE-STABLE PRECURSORS FOR RIGID POLYURETHANE FOAMS

Justin L. Hirshman, East Brunswick, and Kenneth Treadwell, Rahway, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed May 20, 1976, Ser. No. 688,157

Int. Cl.[2] C08K *5/57, 5/17*

U.S. Cl. 252—182 11 Claims

1. In an improved method for preserving catalytic activity during long term storage of precursors for rigid cellular polyurethanes wherein said precursor comprises a polyol containing at least two active hydrogen atoms, as determined by the Zerewitinoff method, and a catalytically effective amount of an organotin compound as the gel catalyst, the improvement which consists of storing said polyol in the presence of a gel catalyst selected from the group consisting of $R_2Sn(SCN)_2$,

$[R_2Sn(SCN)]_2O$, $(R_2SnSCN)_2S$, $(R_2SnX)_2S$ and R_2SnS, wherein R is a monovalent hydrocarbon and X is chlorine, bromine or iodine.

4,136,047

VISCOSITY INDEX IMPROVERS

John B. Rogan, Glen Ellyn, Ill., and Steven A. White, San Francisco, Calif., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 615,606, Sep. 22, 1975, abandoned. This application Nov. 8, 1977, Ser. No. 849,607

Int. Cl.[2] C10M *1/24*

U.S. Cl. 252—56 R **19 Claims**

1. A lubricating composition comprising a base mineral oil and a viscosity index improving amount of a viscosity index improver comprising a block copolymer having two or three block segments, having a molecular weight ranging from about 12,000 to 500,000 and having an $\overline{M}w/\overline{M}n$ ratio less than 2, which comprises (a) from about 5 to 50 wt.% in blocks of styrene or alpha-methylstyrene, and (b) from about 50 to 95 wt.% in blocks of 3,4-dimethyl-alpha-methylstyrene.

13. A lubricating composition comprising a base mineral oil and a viscosity index improving amount of a viscosity index improver comprising a block copolymer having two or three block segments having a molecular weight ranging from about 10,000 to 500,000 and having an $\overline{M}w/\overline{M}n$ ratio less than 2, which comprises (a) from about 5 to 50 wt.% in blocks of styrene or alpha-methylstyrene and (b) from about 50 to 95 wt.% in blocks of lauryl methacrylate.

4,136,048

FLUID HYDROCARBON OIL COMPOSITIONS CONTAINING BLOCK COPOLYMERS FOR IMPROVED VISCOSITY TEMPERATURE RELATIONSHIP

Thomas L. Staples, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 8, 1975, Ser. No. 539,468

Int. Cl.[2] C10M *1/16*

U.S. Cl. 252—59 **11 Claims**

1. A liquid composition exhibiting reversible solution/emulsion phase transition to provide an improved viscosity/temperature relationship, said composition comprising a liquid hydrocarbon oil and a block copolymer having an AB configuration wherein the A portion is a polymeric structure of a polymerized alkenyl aromatic monomer wherein said structure is insoluble in said oil below a transition temperature and soluble above that temperature and the B portion is a polymeric structure of a poly alkylated styrene wherein said structure is soluble in said fluid over the complete range of temperature for which the liquid composition will be used and wherein the molecular weight of the chain length of said B portion is from about 10,000 to 50,000 and is small relative to that of said A portion which has a molecular weight of from about 100,000 to 500,000.

6. A liquid composition exhibiting reversible solution/emulsion phase transition to provide an improved viscosity/temperature relationship, said composition comprising a liquid hydrocarbon oil and at least two block copolymers each having an AB configuration wherein the A portion is a polymeric structure of a polymerized alkenyl aromatic monomer wherein said structure is insoluble in said oil below a transition temperature and soluble above that temperature and the B portion is a polymeric structure of a poly alkylated styrene wherein said structure is soluble in said oil over a complete range of temperature for which the liquid composition will be used and wherein the molecular weight of the chain length of said B portion is from about 10,000 to 50,000 and is small relative to that of said A portion which has a molecular weight of from 100,000 to 500,000 and wherein the transition temperature of each copolymer differs from that of each of the other polymers.

4,136,049

PROCESS FOR TREATING ACICULAR MAGNETITE CONTAINING Co TO STABILIZE THE MAGNETIC PROPERTIES THEREOF

Nanao Horiishi; Atushi Takedoi; Hiroyuki Kondo; Hiroshi Sumita; Akira Mukaizaka, and Goro Matsui, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Aug. 1, 1977, Ser. No. 820,811

Claims priority, application Japan, Aug. 9, 1976, 51-95191

Int. Cl.[2] C01G *49/06, 49/08*

U.S. Cl. 252—62.56 **4 Claims**

1. A process for treating acicular magnetite containing Co to stabilize the magnetic properties against change with lapse of time, comprising the steps of:

heating acicular magnetite having a Fe^{2+}/Fe^{3+} weight ratio in the range of 0.3 to 0.49 and containing 0.1 to 2.5% by atom of Co with respect to Fe as starting material at a temperature in the range of 300–1000° C. in an inert gas atmosphere in which the partial pressure of oxygen is controlled at a value in the range of 0.001–1% by weight and for a time sufficient to effect the equilibrium partial pressure of oxygen in accordance with Gibb's phase rule, and thereafter saturating the resultant acicular magnetite with oxygen by heating it at a temperature in the range of 40 to 100° C. in an air atmosphere while substantially retaining the value of the Fe^{2+}/Fe^{3+} weight ratio that is exhibited by said acicular magnetite after the heating in said inert atmosphere and prior to said saturating with oxygen, whereby obtaining an acicular magnetite having highly stable coercive force with lapse of time.

4,136,050

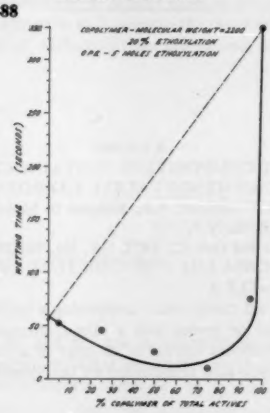
DUST SUPPRESSION METHOD AND COMPOSITION

Gary A. Brehm, Churchville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 16, 1977, Ser. No. 769,087

Int. Cl.[2] C09K *3/22*

U.S. Cl. 252—88 **21 Claims**



1. A method for enhancing the reduction of the dissemination of fugitive dust particles into the atmosphere comprising: treating the dust particles with an effective amount for the purpose of an aqueous solution of octylphenoxy polyethoxy ethanol and copolymer of ethylene oxide and propylene oxide, wherein the weight ratio of the ethanol compound to the copolymer is from about 5/95 to 95/5, wherein the copolymer has a molecular weight of from about 1000 to 16,000 and an ethylene oxide content of from about 10% to 80%, wherein the ethanol compound has from about 5 to 40 moles of ethylene oxide, and wherein the total concentration of the ethanol compound and the copolymer in the aqueous solution is from about 0.005% to 6%.

14. A composition for enhancement of the reduction of the dissemination of fugitive dust into the atmosphere comprising an aqueous solution of:

octylphenoxy polyethoxy ethanol, and copolymer of ethylene oxide and propylene oxide,

wherein the total concentration of the ethanol compound and the copolymer in the aqueous solution is from about 0.005% to 6%, the copolymer has a molecular weight of from about 1000 to 16,000 and an ethylene oxide content of from about 10% to 80%, the ethanol compound has from about 5 to 40 moles of ethylene oxide, and wherein the weight ratio of the ethanol compound to the copolymer is from about 5/95 to 95/5.

4,136,051

POURABLE WASHING COMPOSITIONS CONTAINING A LUMINOSILICATES AND NON-IONICS AND METHOD FOR THEIR PREPARATION

Herbert Saran, Dusseldorf-Holthausen; Peter Krings, Krefeld; Milan J. Schwuger, Haan Rhld., and Heinz Smolka, Langenfeld, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Germany

Continuation-in-part of Ser. No. 549,177, Feb. 12, 1975, abandoned. This application Jul. 8, 1977, Ser. No. 814,046

Claims priority, application Austria, Feb. 25, 1974, 1514/74

Int. Cl.[2] **C02B** *1/44;* **C11D** *3/12, 3/39, 17/06*

U.S. Cl. 252—91 **1 Claim**

1. A pourable washing agent composition consisting of

(I) 59 parts by weight of a premix containing 48.3% by weight of

$$NaBO_2 \cdot H_2O_2 \cdot 3\,H_2O,$$

having a bulk density of 830 gm/l, 34.5% by weight of an aluminosilicate of the composition:

$$0.9\,Na_2O \cdot Al_2O_3 \cdot 2\,SiO_2 \cdot 4\,H_2O$$

a particle size distribution of 100% by weight below 30 μ, 90% by weight below 10 μ, the maximum range of the particle size distribution curve at 1 to 5 μ and a calcium binding power of 165 mg CaO/gm AS, as determined at 22° C according to the Calcium Binding Power Test Method set out in the specification, 5.2% by weight of the addition product of 5 mols of ethylene oxide to 1 mol of tallow fatty alcohol (TA + 5 EO) and 12.0% by weight of the addition product of 14 mols of ethylene oxide to 1 mol of tallow fatty alcohol (TA + 14 EO), said premix being produced by spraying said addition products in liquid form onto the moving powder mixture of the remaining ingredients, and

(II) 41 parts by weight of a spray-dried powder containing

	% By Weight
[ABS] The sodium slat of alkylbenzenesulfonic acid with 10 to 15 carbon atoms in the alkyl chain (ABS)	19.6
[Soap] The sodium salt of a hardened mixture of equal parts by weight of tallow and rape oil fatty acids (Soap)	9.5
[EDTA] The sodium slat of ethylenediaminetetraacetic acid (EDTA)	0.9
Sodium tripolyphosphate	28.0
Waterglass (1:3.3)	14.0
Sodium sulfate	1.4
Magnesium silicate	5.6
[CMC] The sodium salt of carboxymethyl cellulose (CMC)	4.2
Balance (Water, perfume, optical brighteners)	16.8

where the final washing agent composition after mixing said premix and said spray-dried powder was:

	% By Weight
ABS	8.03
TA + 5 EO	3.07
TA + 14 EO	7.08
Soap	3.89
Sodium tripolyphosphate	11.49
EDTA	0.37
Aluminosilicate	20.36
Perborate	28.50
Magnesium silicate	2.29
Waterglass	5.74
Sodium sulfate	0.57
CMC	1.72
Balance (water, perfume, optical brighteners)	6.89

4,136,052

ENCAPSULATED BLEACHES AND METHODS FOR THEIR PREPARATION

Louis R. Mazzola, Mahwah, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 717,718, Aug. 25, 1976, Pat. No. 4,078,099. This application Oct. 14, 1977, Ser. No. 842,208

Int. Cl.[2] **C11D** *7/54, 3/395*

U.S. Cl. 252—94 **19 Claims**

1. A granulated active chlorine bleaching agent encapsulated with a coating comprising:

(a) about 15 to about 25% of the total encapsulate weight of a first coating on said agent consisting essentially of a major proportion of a substantially saturated fatty acid being substantially non-reactive with said agent and having a melting point range of about 85° F. to about 135° F. and a plasticizing amount of a microcrystalline wax having a melting point range of about 125° F. to about 210° F.; and

(b) about 30% to about 40% of the total encapsulate weight of a second coating on said first coating, said second coating consisting essentially of a major proportion of a fatty acid, a sufficient amount of said microcrystalline wax to plasticize said second coating and about 5 to about 20% of the total encapsulate weight of a polyoxyethylene-polyoxypropylene copolymer having at least about 65% by weight of polyoxyethylene and having a molecular weight of about 8000 to about 16,500.

15. A granulated bleaching agent encapsulated with a coating comprising:

(a) about 35% to about 55% of the total encapsulate weight of a coating on said agents consisting essentially of a major proportion of a fatty acid being substantially non-reactive with said agents and having a melting point range of about 85° F. to about 135° F., a plasticizing amount of a microcrystalline wax having a melting point range of about 125° F. to about 210° F.; and

(b) about 5% to about 20% by weight of the total encapsulate weight of a polyoxyethylene-polyoxypropylene copolymer having at least about 65% by weight of polyoxyethylene and having a molecular weight of about 8000 to about 16,500.

4,136,053

BIPHENYL ESTERS AND LIQUID CRYSTALLINE MIXTURES COMPRISING THEM

Rolf Steinsträsser, and Fernando del Pino, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschänkter Haftung, Darmstadt, Fed. Rep. of Germany

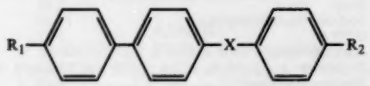
Division of Ser. No. 624,400, Oct. 21, 1975, Pat. No. 4,065,489. This application Oct. 11, 1977, Ser. No. 840,946

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1974, 2450088; Aug. 6, 1975, 2535046

Int. Cl.[2] **C09K** *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **19 Claims**

1. A liquid crystalline mixture comprising two or more nematic liquid crystalline compounds, at least one of which is a biphenyl ester of the formula



wherein X is —CO—O— or —O—CO— and R_1 and R_2 each are alkyl or alkoxy of 1–8 carbon atoms.

4,136,054

CATIONIC TEXTILE AGENT COMPOSITIONS HAVING AN IMPROVED COLD WATER SOLUBILITY

Manfred Petzold; Gunter Uphues, both of Dusseldorf, and Peter Waltenberger, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA), Dusseldorf, Fed. Rep. of Germany

Filed Jun. 7, 1976, Ser. No. 693,313

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1975, 2525610

Int. Cl.[2] **D06M** *1/00;* **C09K** *11/00*

U.S. Cl. 252—301.21 **14 Claims**

1. Cationic textile agent compositions having improved cold water solubility consisting of (1) from 99% to 70% by weight of a cationic textile brightening agent compound containing basic salt-forming nitrogen atoms selected from the group consisting of amino, imino and quaternary ammonium groups and a higher molecular weight alkanoyl group having 8 to 22 carbon atoms, in the form of a salt of a lower carboxylic acid having from 1 to 4 carbon atoms, and (2) from 1% to 30% by weight of a salt condensation product of a primary amine of the formula

$$R - NH_2$$

wherein R is a member selected from the group consisting of alkyl having from 8 to 22 carbon atoms, alkenyl having from 8 to 22 carbon atoms, alkadienyl having from 8 to 22 carbon atoms, and phenylalkyl having from 8 to 22 carbon atoms in the alkyl, with from 6 to 30 mols of an alkylene oxide selected from the group consisting of ethylene oxide and mixtures of ethylene oxide and propylene oxide, reacted at a temperature of from 40° C. to 100° C. under a pressure of at least one excess atmosphere in the presence of at least 5 mols of water per mol of amine and the absense of alkoxylation catalyst, said salt being of an anion of an acid selected from the group consisting of hydrochloric acid, phosphoric acid, alkanoic acids having 1 to 4 carbon atoms and hydroxyalkane polycarboxylic acids having 3 to 6 carbon atoms.

4,136,055

COMPOSITIONS OF ANTIOXIDANTS OF REDUCED VOLATILITY

Bernard J. Lyons, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 481,740, Jun. 21, 1974, Pat. No. 3,986,981, which is a continuation-in-part of Ser. No. 150,831, Jun. 7, 1971, abandoned, which is a continuation-in-part of Ser. No. 660,198, Aug. 14, 1967, abandoned. This application Aug. 23, 1976, Ser. No. 716,593

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

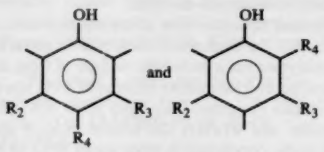
Int. Cl.[2] **C09K** *15/08, 15/10;* **C08G** *75/00*

U.S. Cl. 252—404 **10 Claims**

1. An antioxidant composition comprising a mixture of bisphenolic polymers of formula

$$H—Z—Y—X]_nH$$

wherein *n* is an integer of from 2 to about 12 and average *n* for the mixture is from about 2 to about 10 and wherein Y is independently chosen from the groups consisting of sulfur, methylene and butylidene and for each bisphenolic repeating unit —Z—Y—X—, Z and X are independently selected from the group consisting of



R_2 and R_3 being independently selected from the group consisting of hydrogen and alkyl, cycloaklyl, aryl and alkaryl groups having from 1 to 8 carbon atoms, R_4 being an alkyl group of from 4 to 8 carbon atoms.

4,136,056

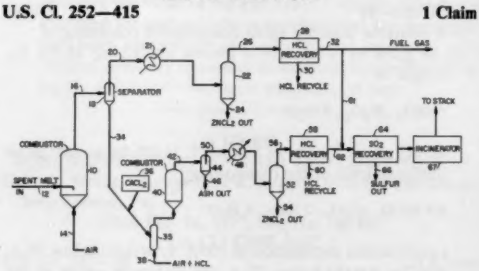
REGENERATION OF ZINC CHLORIDE HYDROCRACKING CATALYST

Clyde W. Zielke, Bethel Park, Pa., assignor to Continental Oil Company, Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 11, 1977, Ser. No. 823,764

Int. Cl.[2] **B01J** *27/32*

U.S. Cl. 252—415 **1 Claim**



1. In a process for regenerating spent molten zinc chloride catalyst resulting from the hydrocracking of coal or coal derived products and containing, in addition to zinc chloride, water-soluble and water-insoluble zinc values in solid form, carbonaceous residue as well as ash, sulfur, and nitrogen components, which comprises (a) subjecting said spent molten zinc chloride catalyst to vapor phase oxidative treatment by combustion of the carbon and sulfur compounds, as well as any ammonia that may be present, at a temperature at least high enough to assure vaporization of zinc chloride, whereby effluent vapors are produced which contain finely divided solids composed of zinc oxide and zinc oxide complexes derived from the hydrocracking of said coal or coal derived products, some of said zinc oxide complexes being water-soluble, and some water-insoluble, along with some residual organic residue in the entrained solids; (b) separating zinc chloride vapors from the solids in said effluent vapors; (c) treating said separated solids with a hydrogen chloride-containing gas under conditions favoring the reaction of zinc oxide and hydrogen chloride at a temperature sufficiently high to form zinc chloride in the vapor state; and (d) separately recovering said vaporous zinc chloride and condensing it to the molten state for recycle to the hydrocracking of said coal or coal derived products, the improvement which comprises

(1) mixing $CaCl_2$ in finely divided form with said separated solids from the above-mentioned step (b) in an amount twice the amount needed to react with said water-insoluble zinc compounds;

(2) mixing said solids from step (1) with a stream of HCL-containing oxygen; and

(3) reacting said zinc oxide and zinc oxide complexes with HCL and $CaCl_2$ at a temperature above the vaporization

temperature of zinc chloride, to form vaporous zinc chloride which is thereafter recovered and condensed as aforementioned in the preamble.

4,136,057
TRANSITION METAL COMPOSITION

John P. Candlin, Aston, near Stevenage, and John A. A. A. G. Segal, London, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 8, 1977, Ser. No. 822,909

Claims priority, application United Kingdom, May 25, 1977, 22044/77

Int. Cl.² C08F *4/02, 4/10, 4/26*

U.S. Cl. 252—429 B **7 Claims**

1. A process which comprises contacting a compound of a transition metal of Group IVA or VA of the Periodic Table with a solid particulate material, wherein the compound of the transition metal contains at least one η^6-arene group and is selected from compounds containing only the transition metal and the η^6-arene group or groups and titanium dichloride-aluminum chloride-arene complex compounds and the solid particulate material consists essentially of at least one compound having the general formula MX_2nL wherein:

M is a metal which is present in the divalent form selected from magnesium and manganese;

X is a halogen atom excluding fluorine;

n is a number such that $0<n\leqq 6$; and

L is an organic Lewis Base compound which is a hydrocarbyl compound containing at least one donor atom which has one, or more, pairs of electrons capable of effecting co-ordination with the metal M, the said donor atom, or atoms, being phosphorus, nitrogen, sulphur or oxygen atoms.

4,136,058
HIGH EFFICIENCY CATALYSTS FOR OLEFIN POLYMERIZATION

James J. Harris, Pittsburgh, and Richard E. Hammond, Irwin, both of Pa., assignors to Arco Polymers, Inc., Philadelphia, Pa.

Filed Feb. 28, 1977, Ser. No. 772,794

Int. Cl.² B01J *31/02*

U.S. Cl. 252—429 B **6 Claims**

1. A catalyst for the polymerization of alpha-monoolefins, in the presence of an organoaluminum activator, consisting essentially of the product from the steps of (1) reacting (a) an organomagnesium compound of formula RMgX where R is alkyl having 1 to 20 carbon atoms, or aryl having 6 to 10 carbon atoms and X is R, halide or —OR or of complexes of these with organometallic compounds of aluminum or zinc, and (b) a transition metal compound selected from the group consisting of the halides, oxyhalides, alcoholates of aliphatic alcohols having 1 to 6 carbon atoms in the alkyl groups, acetates, benzoates, acetyl-acetonates and the dicyclopentadienyl salts of metals in Groups IV-B, V-B, VI-B, and VIII of the Periodic System in a ratio of (a) to (b) of between 0.25:1 and 100:1 and (2) deactivating any excess organomagnesium compound (a) with a deactivation agent for organomagnesium compounds; said deactivation agent being selected from the group consisting of hydrogen chloride, hydrogen bromide, water, acetic acid, alcohols, carbonic acid, phosphorus pentachloride, silicon tetrachloride, acetylene, and mixtures thereof.

4,136,059
METHOD FOR PRODUCING HIGHLY DISPERSED CATALYTIC PLATINUM

Vinod M. Jalan, Manchester, and Calvin L. Bushnell, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,334

Int. Cl.² B01J *21/18, 23/42*

U.S. Cl. 252—447 **32 Claims**

1. A method for producing a highly dispersed platinum containing dispersion comprising: mixing in an aqueous medium chloroplatinic acid or a salt thereof and sodium dithionite to provide a dispersion of platinum containing particles.

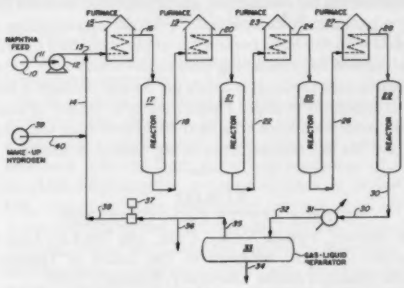
4,136,060
CATALYST AND HYDROCARBON CONVERSION PROCESS

Ralph J. Bertolacini, Chesterton, Ind., and Dae K. Kim, Naperville, Ill., assignors to Standard Oil Company of Indiana, Chicago, Ill.

Division of Ser. No. 817,144, Jul. 20, 1977, which is a continuation-in-part of Ser. No. 640,005, Dec. 12, 1975, abandoned. This application Feb. 16, 1978, Ser. No. 878,606

Int. Cl.² B01J *23/08*

U.S. Cl. 252—455 R **11 Claims**



1. A catalytic composition for the reforming of petroleum hydrocarbons, which catalytic composition consists of from about 0.1 to about 2 weight percent rhenium and from about 0.1 to about 2 weight percent gallium supported on a solid porous refractory inorganic oxide support.

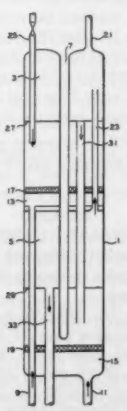
4,136,061
CONTINUOUS, MULTIPLE ZONE FLUIDIZED BED FOR PARTICLE TREATER

John P. Hogan, and Donald R. Witt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 718,300, Aug. 27, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 858,037

Int. Cl.² B01J *29/00, 8/00;* **C01B** *17/82*

U.S. Cl. 252—458 **14 Claims**



1. A multiple zone apparatus for contacting particulate solids with treating gas wherein

(1) each zone is a chamber comprising:

(a) a floor of porosity sufficient to admit fluidizing gas therethrough and to retain thereon the particulate solids to be treated;
(b) a means for supplying fluidizing gas through said floor;
(c) a means for conducting particulate solids out of said chamber having a port sufficiently above said floor to maintain a level of fluidized particles above said floor;
(d) a means for conducting particulate solids into said chamber positioned to discharge at a level lower than the port of said means for conducting particulate solids from said chamber;
(e) a means for conducting gases from said chamber, said means for conducting gases having opening above the level of fluidized particulate solids; and
(2) said zones arranged for gravity overflow of treated particles from each zone to a next treatment zone with overflow from the apparatus from the last treating zone; and
(3) said means for conducting gas arranged to conduct gases to a common collection point without intermingling said gases with fluidized particulate solids in another chamber.

4. A method for contacting particulate solids with treating gas wherein said particulate solids are passed through a multiple zone apparatus of claim 1 with gravity overflow of treated particles from each zone to a next treatment zone with overflow from the last treating zone being treated product.

4,136,062

HIGHLY ACTIVE Pd-Au CATALYST

Michel Boudart, Portola Valley, Calif., and Yiu-Lau Lam, Rio de Janeiro, Brazil, assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 17, 1977, Ser. No. 842,920
Int. Cl.[2] B01J *23/66, 23/56*
U.S. Cl. 252—460 **6 Claims**

1. A catalyst useful in hydrogenation and oxidative dehydrogenation reactions comprising Pd-Au alloy particles containing from about 30 to 80 atomic percent Au and ranging in size from about 15 to 40A, said alloy particles being supported in an amount of from about 1.5 to 10 weight percent on an inert, porous adsorptive, refractory oxide support.

4. A method for preparing a catalyst made up of fine Pd-Au alloy particles of uniform composition held on an inert, porous, adsorptive, refractory oxide support, said method comprising adding a dilute aqueous solution of stable Pd- and Au III-containing compounds, present in proportions calculated to give the desired Pd-Au alloy composition, to a warm dispersion of said support in an aqueous ammoniacal medium whereby Au III- and Pd-containing ions are exchanged for NH_4^+ ions present in the support; washing the resulting support to free the same of other than Au III- and Pd-containing ions; and heating the washed support in dihydrogen at temperatures effective to reduce the metals and form fine Pd-Au alloy particles on the support surfaces; said stable Pd- and Au III-containing compounds each being characterized by the ability to withstand temperatures of 60°–80° C. when in continuous contact with ammoniacal solutions having a pH of at least 11.

4,136,063

CATALYST CARRIER

Sadahiro Kimura; Kiyoshi Uchida, and Hiroyuki Akizuki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 568,550, Apr. 16, 1975, Pat. No. 4,039,481. This application May 27, 1977, Ser. No. 801,237
Claims priority, application Japan, Apr. 20, 1974, 49-044660
The portion of the term of this patent subsequent to Aug. 2, 1994, has been disclaimed.
Int. Cl.[2] B01J *21/04, 23/22, 23/24, 23/74*
U.S. Cl. 252—466 J **3 Claims**

1. Catalyst carrier having a surface layer consisting mainly of α-phase alumina, and an inner portion consisting mainly of alumina that is not α-alumina, which has pores in the α-alumina surface layer which are larger than those in said inner portion.

4,136,064

MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 781,389, Mar. 25, 1977, which is a continuation-in-part of Ser. No. 687,135, May 17, 1976, Pat. No. 4,018,669, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Oct. 21, 1977, Ser. No. 844,159
Int. Cl.[2] B01J *21/04, 23/62, 23/82*
U.S. Cl. 252—466 B **23 Claims**

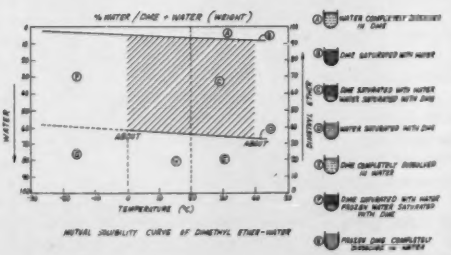
1. A catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 5 wt. % Group IVA metal, and about 0.05 to about 5 wt. % cobalt; wherein the platinum or palladium, rhodium and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and rhodium are present in the elemental metallic state; wherein substantially all of the Group IVA metal is present in an oxidation state above that of the corresponding metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,136,065

EXTRACTION METHOD FOR ODOR AND FLAVOR PRODUCING INGREDIENTS OF FOODS AND FLOWERS AND PRODUCTS PRODUCED

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo, and Mitsuo Takano, Sakai, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 655,573, Feb. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 491,228, Jul. 24, 1974, Pat. No. 4,069,351. This application Jun. 6, 1977, Ser. No. 804,018
Claims priority, application Japan, Aug. 6, 1973, 48-88184; Feb. 16, 1974, 49-18880; Jun. 13, 1974, 49-66493
Int. Cl.[2] A61K *7/46;* **C11B** *9/02*
U.S. Cl. 252—522 **12 Claims**


% WATER / DME + WATER (WEIGHT)
WATER
DIMETHYL ETHER
TEMPERATURE (°C)
ABOUT
ABOUT
WATER COMPLETELY DISSOLVED IN DME
DME SATURATED WITH WATER
DME SEPARATED WITH WATER WATER SATURATED WITH DME
WATER SATURATED WITH DME
DME COMPLETELY DISSOLVED IN WATER
DME SEPARATED WITH WATER FROZEN WATER SATURATED WITH DME
FROZEN DME COMPLETELY DISSOLVED IN WATER

MUTUAL SOLUBILITY CURVE OF DIMETHYL ETHER-WATER

1. A method for obtaining a mixture containing hydrophilic and lipophilic odor producing components of flower substrates which comprises extracting said flowers with a liquid dimethyl ether-water extract mixture, free of solid phase dimethyl ether or water, at a temperature of from about −25° C. to 40° C., and thereafter separating the extraction residue and removing at least the dimethyl ether portion of the extraction mixture by evaporation; the weight ratio of dimethyl ether to substrate being from 1:1 to 5:1, the weight ratio of water to dimethyl ether in the extraction mixture being such that in the phase diagram of the system shown in FIG. 2 hereof, the amounts of each component are defined as a point in the area C or as a point located along the line B.

4,136,066

1-CROTONYL-2,2,6-TRIMETHYLCYCLOHEXANE

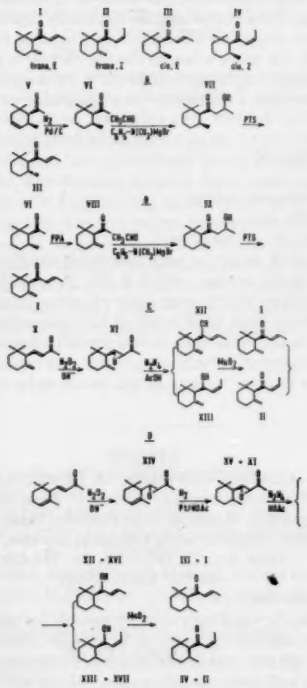
Douwe R. De Haan, Soest, and Dirk K. Kettenes, Putten, both of Netherlands, assignors to P.F.W. Beheer B.V., Amersfoort, Netherlands

Continuation-in-part of Ser. No. 681,202, Apr. 28, 1976, Pat. No. 4,109,022, which is a division of Ser. No. 409,099, Oct. 24, 1973, Pat. No. 3,956,392. This application Apr. 13, 1978, Ser. No. 896,224

Claims priority, application United Kingdom, Oct. 26, 1972, 49368/72

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 4 Claims



1. A perfume composition to which has been added a member selected from the group consisting of trans, E-1-crotonoyl-2,2,6-trimethylcyclohexane and cis, E-1-crotonoyl-2,2,6-trimethylcyclohexane, or mixtures thereof in an amount effective to impart a perfume characteristic to said composition.

4,136,067

HYBRID ION EXCHANGE RESINS WITH IMPROVED PROPERTIES

Samuel F. Reed, Holland, and James H. Barrett, Neshaminy Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 2, 1977, Ser. No. 856,826

Int. Cl.[2] C08F *8/32;* B01J *1/08*

U.S. Cl. 521—32 7 Claims

1. A heterogeneous hybrid, weak acid, weak base ion exchange resin comprising a crosslinked aromatic macroporous host copolymer having weak base functional anion exchange sites supplied by polyalkylene polyamine molecules having an average molecular weight of about 600 to about 60,000, grafted onto the aromatic nuclei, and a crosslinked, gel quest copolymer imbibed in the macropores of the host copolymer, the imbibed copolymer being functionalized with weak acid functional cation exchange sites.

4,136,068

CELLULOSE ESTER GRAFT POLYMER/ACRYLIC CO-POLYMER/AMINO RESIN WATER DISPERSIBLE COATING COMPOSITION

Yukio Nomura; Osamu Nagura, both of Nishinomiya, and Hiromasa Masuda, Toyonaka, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,731

Claims priority, application Japan, Aug. 12, 1976, 51-95345

Int. Cl.[2] C08L *1/10, 1/14*

U.S. Cl. 260—15 10 Claims

1. A water dispersable coating composition consisting of the following three components

A. 10–34 parts by weight of a water dispersable cellulose graft polymer obtained by graft polymerizing styrene, ethylenically unsaturated carboxylic acid and a vinyl monomer selected from the group consisting of methyl acrylate, ethyl acrylate, n-propyl acrylate, isopropyl acrylate, n-butyl acrylate, cyclohexyl acrylate, octyl acrylate, 2-ethylhexyl acrylate, methoxyethyl acrylate, ethoxyethyl acrylate, butoxyethyl acrylate, methyl methacrylate, ethyl methacrylate, n-propyl methacrylate, isopropyl methacrylate, n-butyl methacrylate, cyclohexyl methacrylate, octyl methacrylate, 2-ethylhexyl methacrylate, lauryl methacrylate, vinyl acetate and vinyl ether to a reaction product of a cellulose ester derivative having 1–20% by weight of free hydroxyl group with maleic anhydride,

B. 33–80 parts by weight of a water dispersable acrylic copolymer consisting of ethylenically unsaturated monomer having hydroxyl group, ethylenically unsaturated carboxylic acid and a vinyl monomer selected from the group consisting of acrylates, methacrylates, styrene, vinyl toluene and vinyl acetate, and

C. 10–33 parts by weight of amino resin selected from the group consisting of hexamethoxymethylmelamine, methoxybutoxymethylmelamine, methoxymethylated urea, methoxybutoxymethylated urea and guanamine,

said parts by weight being amounts of non-volatile matter.

4,136,069

HOT MELT SIZING COMPOSITIONS AND FIBROUS ARTICLES SIZED THEREWITH

Raymond N. Vachon, and Richard L. McConnell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 597,122, Jul. 18, 1975, abandoned. This application May 5, 1977, Ser. No. 794,181

Int. Cl.[2] C08L *23/08*

U.S. Cl. 260—23 AR 8 Claims

1. A composition useful as a textile sizing composition comprising: a blend of about 35–80 weight percent of at least one member of the group consisting of copolymers consisting of ethylene and α,β-unsaturated carboxylic acids containing 75–90 weight percent ethylene and having a melt viscosity of about 10,000 to 200,000 cp. at 190° C. and about 5 to 50 weight percent of at least one member of the group consisting of copolymers consisting of ethylene and α,β-unsaturated carboxylic acids containing about 80–95 weight percent ethylene and having a melt viscosity of about 1500 cp. to 100 cp. at 140° C.

4,136,070

CATHODIC ELECTRODEPOSITION OF PAINTS

Isidor Hazan, Plementon, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 845,891, Oct. 31, 1977, and a continuation-in-part of Ser. No. 815,084, Jul. 13, 1977, abandoned, said Ser. No. 845,891, is a continuation-in-part of Ser. No. 746,298, Dec. 1, 1976, abandoned, said Ser. No. 815,084, is a division of Ser. No. 746,298,. This application Nov. 21, 1977, Ser. No. 853,439

Int. Cl.[2] C09D *3/58, 5/02, 5/40;* C25D *13/06*

U.S. Cl. 260—23 AR 22 Claims

1. As a composition of matter, a graft copolymer comprising an epoxide grafted onto an acrylic backbone portion and consisting essentially of, by weight based on the graft copolymer, about:

a. in the acrylic backbone portion: 15 to 25% of a polymer or copolymer of at least one unit selected from alkyl, aminoalkyl, and hydroxyalkyl acrylates and methacrylates, said copolymer containing 0.02 to 0.1 equivalent of secondary and/or tertiary amine functionality; and

b. in the graft: 75 to 85% of a copolymer contributing:

3 to 7% of a glycidyl ester of a tertiary carboxylic acid containing 7 to 9 carbon atoms, and

72 to 80% of a blend of a 55 to 60% condensation polymer of epichlorohydrin and bisphenol-A with 15 to 20% tall oil fatty acids.

4,136,071

MIXED BLOCK POLYMER ADHESIVE

Ralf Korpman, Bridgewater, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 18, 1976, Ser. No. 687,573

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—27 BB 3 Claims

1. A pressure-sensitive adhesive composition comprising a thermoplastic elastomeric component and a resin component; said thermoplastic elastomeric component consisting essentially of about 50–90 parts of a linear or radial A-B-A block copolymer and about 10–50 parts of a simple A-B block copolymer, said A-blocks being derived from styrene or styrene homologues and said B-blocks being derived from isoprene; said resin component consisting essentially of about 20–300 parts of tackifier resin for said elastomeric component; all of said parts being parts per one hundred parts by weight of the thermoplastic elastomeric component.

4,136,072

THERMOPLASTIC POLYOLEFIN FILM COMPOSITIONS

Charles E. Ladish, Beaver, and Earl S. Hill, Jr., Coraopolis, both of Pa., assignors to Arco Polymers, Inc., Philadelphia, Pa.

Filed May 24, 1977, Ser. No. 800,144

Int. Cl.[2] C08L *93/00*

U.S. Cl. 260—27 R 8 Claims

1. A thermoplastic polyolefin film composition suitable for packaging use comprising a polyolefin containing one or more additives having a plasticizing effect and about 0.05% to about 1.0% of a shellac.

4,136,073

PROCESS FOR TREATING AN ALUMINUM SURFACE

Kakuro Muro, Komae; Kuniji Yashiro, Yokohama; Hideaki Kaneko, and Kiyoichi Yamazaki, both of Tokyo, all of Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Dec. 22, 1975, Ser. No. 642,960

Claims priority, application Japan, Dec. 25, 1974, 49/147949

Int. Cl.[2] B44D *1/06;* C08L *7/00, 9/00, 31/00*

U.S. Cl. 260—29.2 EP 7 Claims

1. A process for treating an aluminum surface without the use of chromium chemicals comprising contacting the surface with an aqueous chromium-free acidic composition consisting essentially of a stable organic film-forming polymer and a soluble titanium compound in a weight ratio of polymer : Ti of 100 : 1 to 1 : 10.

4,136,074

PROCESS AND BATH COMPOSITION FOR INCREASING THE RATE OF POLYMER DEPOSITION IN ELECTROCOATING

Michael A. Dudley, Beaconsfield, Canada, assignor to Canada Wire & Cable Limited, Toronto, Canada

Division of Ser. No. 429,771, Jan. 2, 1974, Pat. No. 4,020,028. This application Nov. 12, 1975, Ser. No. 630,944

Claims priority, application Canada, Dec. 29, 1972, 160228

Int. Cl.[2] C08L *33/02, 63/00, 67/02*

U.S. Cl. 260—29.2 EP 21 Claims

1. An electrocoating bath composition for depositing a coat of electrodepositable polymer material onto an anode, said bath composition comprising an essentially aqueous solution, emulsion or dispersion of said polymer suitable for electrodeposition on the anode when an electric current is passed therethrough, and comprising 0.01 to 2.0% by weight with reference to the bath composition of a compound of the general formula:

$$X - R - X'$$

wherein

R is an organic radical,

X is —SH, and

X′ is a hydrogen atom or X,

said groups X being in such electronic configuration with reference to the organic radical R that there is always a presence of labile protons therein under operative conditions of the electrocoating bath, or of a salt of said compound, said compound or its salt being in an at least partially disassociated state in said electrocoating bath composition and capable or proton association in close vicinity of the anode under conditions of operation.

4,136,075

ACRYLIC COPOLYMER COATINGS

William M. Finn, Decatur, Ill.; Michael C. Peck, Savannah, Ga., and Maynard R. Winstead, West Peabody, Mass., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 27, 1977, Ser. No. 791,453

Int. Cl.[2] C08L *33/00*

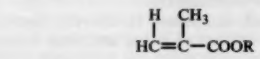
U.S. Cl. 260—29.6 TA 40 Claims

1. An acrylic copolymer solution suitable for use in conjunction with cross-linking reagents to provide cross-linked coatings, said acrylic copolymer solution comprising an acrylic copolymer and watermiscible organic solvent with said acrylic copolymer consisting essentially of the copolymerization reaction product of:

(a) 5 to less than 16 parts by weight of at least one alpha-beta ethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid;

(b) 100 parts by weight methyl acrylate and ethyl acrylate with the weight ratio of copolymerized methyl acrylate to ethyl acrylate in said copolymer ranging from about 3:1 to about 1:2; and

(c) about 1 to 13 parts by weight of a comonomer represented by the structural formula:



wherein R is an alkyl group of 1 to 4 carbon atoms inclusive, and the volatile base salts thereof, said copolymer being further characterized as having a T_g from about −30° C. to 0° C., a weight-average molecular weight to number-average factor between 1/1 to 4/1, a weight-average molecular weight of about 20,000 to about 40,000,

insoluble in water and soluble in n-Propanol at 25° C. and 50% by weight acrylic copolymer solids level when said copolymer is in the acid form and forming a water-soluble, acrylic copolymer salt when neutralized with ammonia to a pH ranging from about 7 to about 9.

4,136,076

INK JET PRINTING COMPOSITION COMPRISING A SOLVENT, A DYE STUFF, A VOLATILE BASE, A MULTI-VALENT METAL AND A POLYMER CONTAINING CARBOXYL GROUPS

George R. E. Daniels, Boston, Mass., assignor to Dennison Manufacturing Co., Framingham, Mass.

Filed Oct. 25, 1977, Ser. No. 845,186
Int. Cl.[2] C08L *33/02*
U.S. Cl. 260—29.6 HN **10 Claims**

1. The method of ink jet printing employing a jet printing ink having a viscosity below about 5 cps at 20° C. and an electrical resistivity below about 3000 ohm cm., said ink comprising a solvent consisting predominantly of water, lower alcohols, or mixtures thereof and having dissolved therein soluble dyestuff, a volatile base, film-forming polymer means, and multivalent metal ion means for cross-linking said polymer on drying, said polymer containing carboxyl groups substantially inert to said metal ion means in the presence of said volatile base but being cross-linked therewith upon evaporation thereof to form an ionically cross-linked polymer substantially insoluble in water, said soluble dyestuff being present in an amount equal to at least about 10% of the dry weight of said polymer.

4,136,077

REACTION PRODUCT OF OLEFINICALLY-UNSATURATED NITRILE AND A MONOOLEFINIC HYDROCARBON AS PLASTICIZER FOR CONJUGATED DIENE-UNSATURATED NITRILE RUBBER

Ralph P. Williams, and William S. Howard, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 16, 1977, Ser. No. 861,374
Int. Cl.[2] C08K *5/16*
U.S. Cl. 260—32.4 **7 Claims**

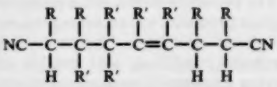
1. A conjugated diene-unsaturated nitrile rubber plasticized with at least one reaction product of an olefinically unsaturated nitrile, having the general formula

(I) RCH=CR—CN

and a monoolefinic hydrocarbon, containing an allylic hydrogen atom and represented by the formula

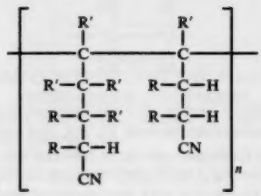
(II) $R'_2C{=}CR'CHR'{-}_2$,

which have been thermally contacted to produce an unsaturated diadduct product having the formula



(III)

wherein each R and each R′ is independently selected from the group consisting of hydrogen and hydrocarbyl radicals, and an oligomer thereof, which can be represented by the formula



wherein R and R′ are as defined earlier and n is equal to an integer in the range 2 to 20.

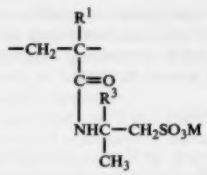
4,136,078

COMPOSITIONS COMPRISING A PLASTICIZER AND AN N-SULFOHYDROCARBON-SUBSTITUTED ACRYLAMIDE POLYMER

Roger H. Doggett, Natick, and Henry L. Buccigross, Needham, both of Mass., assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 302,339, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 145,945, May 21, 1971, abandoned. This application Jun. 3, 1974, Ser. No. 476,014
Int. Cl.[2] C08K *5/05, 5/06*
U.S. Cl. 260—33.2 R **3 Claims**

1. An adhesive composition comprising glycerol, sorbitol or polyethylene glycol as plasticizer and at least one homopolymer containing units of the formula



wherein each of R^1 and R^3 is hydrogen or methyl and M is hydrogen or one equivalent of a cation; said plasticizer comprising about 25–50% by weight of said composition.

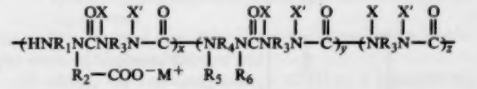
4,136,079

UREA COMPOUND HAVING CARBOXYLATE RADICAL AND METHOD FOR PRODUCING THE SAME

Shitomi Katayama; Nobuaki Koyama; Hajime Shimabukuro, all of Yokohama, and Kiyoshi Jin, Shiki, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Feb. 17, 1978, Ser. No. 878,911
Claims priority, application Japan, Feb. 25, 1977, 52-19981
Int. Cl.[2] C08G *18/32*
U.S. Cl. 260—37 N **50 Claims**

1. A urea compound having carboxylate radical, represented by the formula:



where R_1 is a divalent hydrocarbon-based radical having 2 to 17 carbon atoms or a divalent polymer radical having an average molecular weight of 10,000 or less; R_2 is

radical with the α-carbon directly bonded with the carbon atom of the carboxylate radical; Ri, Rii, Riii and Riv are each independently hydrogen atom, a monovalent hydrocarbon-based radical having 1 to 10 carbon atoms or any other monovalent radical unreactive with isocyanato or amino radicals, at least one of Ri and Rii being hydrogen atoms; R_3 is a divalent hydrocarbon-based radical having 4 to 25 carbon atoms, or a polyether or polyester radical having an average molecular weight of 10,000 or less; R_4 is a divalent hydrocarbon-based radical having 2 to 17 carbon atoms; R_5 and R_6 are each independently hydrogen atom or a monovalent hydrocarbon-based radical having 1 to 8 carbon atoms, or R_5 and R_6 are divalent hydrocarbon-based radicals forming together by mutual bond a carbon chain having 2 to 13 carbon atoms or its side chain substituent; X and X' are each independently hydrogen atom or —CONH— radical; M^+ is a cation; and x, y and z are values indicating the relative molar proportions of the respective corresponding units and complying with required normalizations: $x+y+z=1$ and $0.1>100x/(x+y+z)\leqq 100$.

4,136,080

POLYESTER COMPOSITES

Sidney E. Berger, Rye, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,936
Int. Cl.[2] C08K *9/06*
U.S. Cl. 260—40 R **9 Claims**

1. A reinforced polyester composition comprising therein alumina trihydrate particles containing on their surfaces a silane, its hydrolyzates or resulting condensate, which silane has the following general formula:

$$R^{II}(OR^{I})_aORSiX_3$$

wherein R can be any divalent organic group which is either oxygen or carbon bonded to the silicon atom, R^I is one or more 1,2-alkylene groups each containing at least 2 carbon atoms and typically not more than about 4 carbon atoms; R^{II} is hydrogen, alkyl, acyloxy or an organofunctional group; X is a hydrolyzable group; and a is a number having an average value of 4 to about 150.

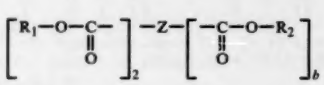
4,136,081

2,2,6,6-TETRAMETHYL-4-PIPERIDYL CARBOXYLIC ACID ESTERS OF ALIPHATIC TETRACARBOXYLIC ACIDS AS STABILIZERS FOR SYNTHETIC POLYMERS

Motonobu Minagawa, Kosigaya; Naohiro Kubota, and Toshihiro Shibata, both of Urawa, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

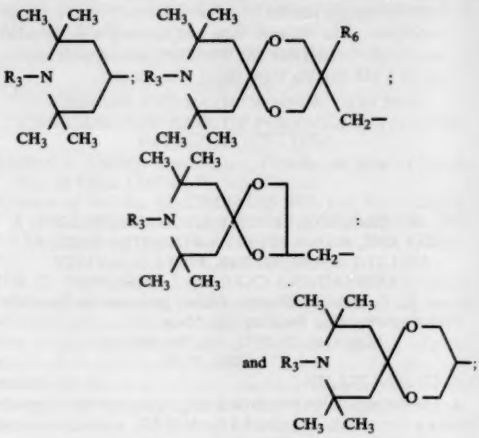
Filed Oct. 28, 1976, Ser. No. 736,288
Claims priority, application Japan, Nov. 19, 1975, 50-139086
Int. Cl.[2] C08K *5/34*; C07D *211/6*
U.S. Cl. 260—45.8 N **30 Claims**

1. A 2,2,6,6-tetramethyl-4-piperidyl carboxylic acid ester of an aliphatic or cycloaliphatic tetracarboxylic acid having the general formula:



wherein:

R_1 is selected from the group consisting of



and when a is 2, 3, or 4, the R_1 groups can be the same or different;

R_2 is selected from the group consisting of hydrogen; alkyl; alkenyl; cycloalkyl; alkcycloalkyl; cycloalkalkyl; aryl; aralkyl; and alkaryl; and when b is 2 or 3, the R_2 groups can be the same or different;

R_3 is selected from the group consisting of hydrogen and O;

R_6 is lower alkyl;

a is selected from the group consisting of 1, 2, 3 and 4;

b is selected from the group consisting of 0, 1, 2 and 3;

a + b is equal to 4; and

Z is a tetravalent aliphatic or cycloaliphatic radical having from two to about twenty-four carbon atoms and carrying four

groups, where R is R_1 or R_2, and can include from one to three hydroxyl groups OH.

24. An olefin polymer composition having improved resistance to deterioration comprising an olefin polymer selected from the group consisting of polymers of alpha-olefins having from two to six carbon atoms and polystyrene, and a compound in accordance with claim **1**.

4,136,082

FLAME-RETARDANT POLYOLEFINS

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 657,821, Feb. 13, 1976, Pat. No. 4,096,113, which is a continuation-in-part of Ser. No. 488,668, Jul. 15, 1974, abandoned. This application Oct. 28, 1977, Ser. No. 846,462
Int. Cl.[2] C08K *5/17, 5/52*
U.S. Cl. 260—45.9 AD **15 Claims**

1. A flame-retardant polyolefin composition comprising normally solid polyolefin, a hydrohalide salt of a mono- or diamine in which the amine group is attached to or incorporated within a hydrocarbyl radical which is aromatic or aliphatic containing 2 to 24 carbon atoms, and a phosphorus-containing flame retardant produced by combining reactants comprising ortho-phosphoric acid, urea, dipentaerythritol, and melamine under suitable conditions, said suitable conditions comprising employing amounts of said reactants suitable for yielding said phosphorus-containing flame retardant and heating said combined reactants at a temperature suitable for yielding said phosphorus-containing flame retardant for a period which will assure that said phosphorus-containing flame retar-

dant will not cause significant foaming of the polyolefin composition when said polyolefin composition is subjected to molding conditions.

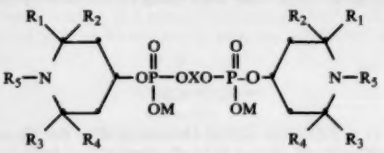
4,136,083

PIPERIDINYL HYDROGEN ALKYLENE OR ARYLENE PHOSPHATES AND METAL SALTS THEREOF WHICH COMPOUNDS ARE USEFUL AS ULTRAVIOLET STABILIZERS FOR ORGANIC COMPOSITIONS

Gether Irick, Jr., and Richard H. S. Wang, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 16, 1978, Ser. No. 906,397
Int. Cl.[2] C08K 5/34
U.S. Cl. 252—400 A **18 Claims**

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of piperidinyl phosphate having the formula:



R_1 and R_2 are each alkyl having 1–6 carbons; R_3 and R_4 are each alkyl having 1–6 carbons or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group; and R_5 is hydrogen, oxy, alkyl having 1 to 12 carbon atoms, β-methoxyethyl, alkenyl having 3 or 4 carbon atoms, propargyl, benzyl or alkyl substituted benzyl, and M is either hydrogen or a metal ion selected from the group consisting of Li, Na, K, Mg, Ca, Ba, Mn, Co, Ni, Sn, Zn, Ce, and the amount of hydrogen for M can vary from zero to 100% and X is an alkylene having 2 to 12 carbon atoms or an arylene with 6, 12 or 18 carbon atoms.

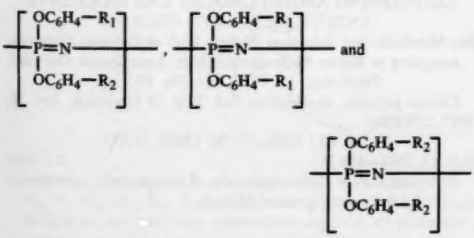
4,136,084

MOLECULAR-WEIGHT MODIFICATION OF POLYPHOSPHAZENES

Ronald L. Dieck; Louis Goldfarb, and Nancy D. Hann, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 694,978, Jun. 11, 1976, Pat. No. 4,092,278. This application Jan. 5, 1978, Ser. No. 867,022
Int. Cl.[2] C08G 79/04; C08J 9/06
U.S. Cl. 528—481 **2 Claims**

1. A process for substantially reducing the molecular weight of a curable poly(aryloxyphosphazene) polymer having randomly distributed repeating units of the formula



wherein R_1 and R_2 are the same or different and represent hydrogen, C_1-C_{10} linear or branched alkyl, C_1–C_4 linear or branched alkoxy, which process comprises heating said polymer to a temperature of from about 100° to about 300° C., in the absence of air or oxygen, for a period of at least 15 minutes, to produce a poly(aryloxyphosphazene) polymer having a reduced molecular weight and being uncrosslinked and uncured.

4,136,085

PROCESS FOR CONTROLLING THE MELT FLOW OF AMIDE-IMIDE POLYMERS

Robert B. Hanson, Aurora, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 20, 1978, Ser. No. 871,103
Int. Cl.[2] C08G 73/14
U.S. Cl. 528—189 **4 Claims**

1. A process for preparing an improved amide-imide polymer comprising reacting in an organic solvent with each mole consisting of one or more aromatic primary diamines between about 0.92 and about 0.99 mole of substantially pure 4-trimellitoyl anhydride halide and between about 0.08 and about 0.01 mole of trimellitic acid anhydride.

4,136,086

CURABLE EPOXIDE RESIN MIXTURES

Dieter Baumann, Rheinfelden, and Heinz Rembold, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,282
Claims priority, application Switzerland, Mar. 10, 1977, 3028/77
Int. Cl.[2] C08G 59/66
U.S. Cl. 528—99 **10 Claims**

1. A curable mixture based on epoxide compounds, dimercapto compounds and polycarboxylic anhydrides, which mixture comprises

(a) an epoxide compound having on an average more than one 1,2-epoxide group in the molecule,

(b) an adduct containing mercapto groups, which is obtained by reaction of n mol of a diglycidyl compound with n+1 mols of an aliphatic or aromatic dimercapto compound, where n denotes an integer, and

(c) a polycarboxylic anhydride,

the amounts contained being such that there are present in the curable mixture 0.1 to 0.5 equivalent of mercapto groups of the adduct (b) and 0.9 to 0.5 equivalent of an anhydride group of the polycarboxylic anhydride (c) per 1 equivalent of an epoxide group of the epoxide compound (a).

4,136,087

METHOD FOR MAKING AROMATIC CYCLIC POLYFORMALS

Frank J. Williams, III, Scotia, and Paul E. Donahue, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 15, 1978, Ser. No. 905,636
Int. Cl.[2] C08G 65/40
U.S. Cl. 528—219 **6 Claims**

1. A method for making aromatic cyclic polyformal which comprises,

(1) stirring a mixture at a temperature of from 25° C. to 80° C. comprising

(a) methylene halide and

(b) the anhydrous bisphenol dianion formed by refluxing and azeotroping a mixture of an alkali metal hydroxide, and a bisphenol, in the presence of a mixture of a dipolar aprotic solvent and an aromatic hydrocarbon azeotroping solvent,

where there is used from 1 to 100 moles of methylene halide, per mole of bisphenol dianion and

(2) adding the resulting mixture of (1) to a precipitating solvent,

(3) recovering aromatic polyformal from (2) and

(4) thereafter extracting with a dialkyl ketone aromatic cyclic polyformal from the aromatic polyformal of (3).

4,136,088

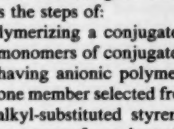
METHOD FOR RECOVERING LOW MOLECULAR WEIGHT POLYMERS

Atsushi Kaiya, Kawasaki; Eizo Arai, Yokohama; Hideo Kawaguchi, Kawasaki, and Kazuo Miyazaki, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

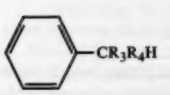
Filed Mar. 14, 1977, Ser. No. 777,516
Claims priority, application Japan, Mar. 19, 1976, 51-29192
Int. Cl.[2] C07C *15/00*
U.S. Cl. 260—669 P 7 Claims

1. In a method for obtaining a liquid low molecular weight polymer containing no catalyst residue, which method comprises the steps of:

polymerizing a conjugated diolefin or copolymerizing comonomers of conjugated diolefins and a vinyl compound having anionic polymerization activity which is at least one member selected from the group consisting of styrene, alkyl-substituted styrenes, and vinyl napthalene, in the presence of a polymerization catalyst mainly containing an organic sodium compound represented by the general formula:



in which each of R_1 and R_2 is a hydrogen atom or an alkyl group, and a chain transfer agent of an alkyl aryl compound represented by the general formula:



in which each of R_3 and R_4 is a hydrogen atom or an alkyl group to obtain a polymerization mixture; and thereafter recovering said liquid low molecular weight polymer, the improvement which comprises effecting said recovery by:

uniformly mixing 100 parts by volume of said polymerization mixture with 50 to 200 parts by volume of an agent which consists essentially of an isopropyl alcohol aqueous solution of 10 to 60% by weight in concentration;

separating thus formed mixture into two phases of a polymer mixture containing said liquid low molecular weight polymer and an isopropyl alcohol aqueous solution containing catalyst residue; and

separating said liquid low molecular weight polymer from said polymer mixture.

4,136,089

MOLDED ARTICLES OF CRYSTALLINE POLY (ETHYLENE/ALKYLENE) TEREPHTHALATES WHICH CRYSTALLIZE RAPIDLY

Peter Bier; Rudolf Binsack, and Hugo Vernaleken, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 658,816, Feb. 17, 1976, Pat. No. 4,086,212. This application Aug. 16, 1977, Ser. No. 825,121
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507674
Int. Cl.[2] C08G *63/18*
U.S. Cl. 528—309 1 Claim

1. Molded articles of highly crystalline, thermoplastic terephthalic acid copolyesters which crystallize rapidly and which consist of at least 90 mol %, relative to the dicarboxylic acid component, of terephthalic acid radicals, 95.2 to 99.5 mol %, relative to the diol component, of ethylene glycol radicals and 0.5 to 4.8 mol %, relative to the diol component, of 2.2-diethyl propane-1.3-diol radicals.

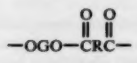
4,136,090

STABILIZED COPOLYETHERESTER COMPOSITIONS

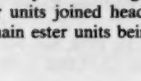
Guenther K. Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 2, 1978, Ser. No. 882,785
Int. Cl.[2] C08G *63/68*
U.S. Cl. 260—45.95 H 16 Claims

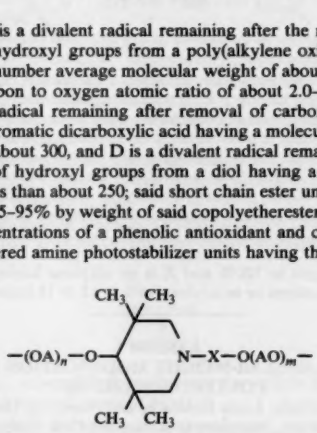
1. A copolyetherester composition stabilized against oxidative degradation due to exposure to heat and light, said composition consisting essentially of a copolyetherester consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula



and said short chain ester units being represented by the formula



where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a number average molecular weight of about 400–6000 and a carbon to oxygen atomic ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from an aromatic dicarboxylic acid having a molecular weight less than about 300, and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; said short chain ester units amount to about 15–95% by weight of said copolyetherester and effective concentrations of a phenolic antioxidant and copolymerized hindered amine photostabilizer units having the formula



wherein A is ethylene and/or propylene, X is a divalent hydrocarbon radical of 2 to 18 carbon atoms and (n + m) equals 5 to 40, said photostabilizer units being connected to ester units in the copolyetherester through ester linkages.

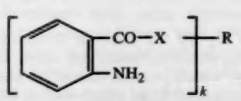
4,136,091

PROCESS FOR THE PREPARATION OF POLYMERS CONTAINING AMINO GROUPS AND HYDROXYL AND/OR MERCAPTO GROUPS

Jan Mazánek, and Johannes Blahak, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 15, 1977, Ser. No. 824,460
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2702050
Int. Cl.[2] C08L *75/00;* C08G *18/00*
U.S. Cl. 260—455 R 4 Claims

1. A process for the preparation of compounds corresponding to the following general formula:



wherein

X represents oxygen or sulphur;

R represents a k-valent radical obtained by removal of k hydroxyl and/or mercapto groups from an active hydrogen containing material selected from the group consisting of polyether polyols, polythioether polythiols, polyols containing both polyether and polythioether segments, and polythiols containing both polyether and polythioether segments, said material having n hydroxyl and/or mercapto groups and having a molecular weight of from 1,300 to 60,000;

n represents an integer of from 2 to 8; and

k has an average value of from 0.05 n to 0.9 n,

characterized in that said active hydrogen containing materials are reacted with from 5 to 90% of the equivalent quantity (based on the total quantity of hydroxyl and/or mercapto groups) of isatoic acid anhydride in the presence of basic organic and/or inorganic catalysts at temperatures of from 20° to 130° C. in a first reaction stage and, when evolution of carbon dioxide has ceased, the reaction mixture is maintained, in a second reaction stage, at a temperature of from 140° to 240° C. for a period of from 30 minutes to 10 hours, optionally under nitrogen.

4,136,092

POLYURETHANE CURING AGENTS

William A. Jackle, Newtown, Pa.; Michael P. Mazzeo, Hightstown, N.J., and Marina N. Gillis, Yardley, Pa., assignors to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 585,150, Jun. 9, 1975, abandoned. This application May 11, 1976, Ser. No. 685,215

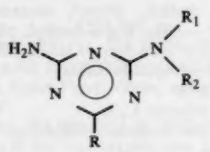
Int. Cl.[2] C08G *71/04*

U.S. Cl. 528—60 **13 Claims**

1. A curable composition comprising:

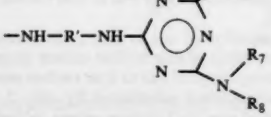
(a) an isocyanate-terminated polyurethane prepolymer and

(b) a compound of formula



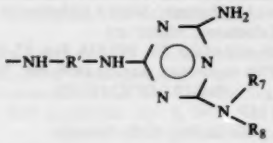
where R is

—S—R_5 —O—R_6 or



where at least one of R_1, R_2, R_3, and R_4 is hydrogen, R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 each independently is hydrogen or an optionally substituted aliphatic or aromatic group, provided however that said aliphatic or aromatic group may not be substituted with hydroxy and that R_1, R_2, R_3, R_4, R_5, and R_6 may not have ethylenic >C=C< bonds;

R′ is the divalent residue of an organic diamine, the residue of an organic diisocyanate, or the residue of an organic diepoxide, and where all R_1, R_2, R_3, R_4, R_5 and R_6 are not all simultaneously hydrogen provided however when R is



that R_1, R_2, R_7 and R_8 can all be hydrogen, that R_1 and R_2 may contain ethylenic >C=C< bonds; and that if either member of the pairs R_1, R_2 or R_7, R_8 contains ethylenic >C=C< bonds, the other member of the same pair must be hydrogen.

4,136,093

HEMOGLOBIN PREPARATION WITH INCREASED OXYGEN RELEASE

Klaus Bonhard, Hanau; Uwe Boysen, and Hans Schleubner, both of Frankfurt am Main, Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt am Main, Germany

Filed Apr. 21, 1977, Ser. No. 789,759

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617822; Mar. 31, 1977, 2617882

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 R **13 Claims**

1. A method of manufacturing a hemoglobin preparation, comprising washing human erythrocytes at least four times with a weakly alkaline solution, hemolyzing the erythrocytes in a solvent consisting essentially of water, treating the hemolyzate material with a cation exchange resin in the H+ form until the pH value has dropped to about 5 to 5.5, separating the material from resin and any precipitated stroma, diluting the material with water to a hemoglobin concentration of about 5 to 9%, adjusting the pH to about 7 to 9, displacing any oxygen therein, and adding about 0.25 to 1.25 g of pyridoxal-5-phosphate per liter of hemoglobin solution of 5 to 9% concentration.

4,136,094

PREPARATION OF INTRAVENOUS HUMAN AND ANIMAL GAMMA GLOBULINS AND ISOLATION OF ALBUMIN

Richard M. Condie, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 31, 1977, Ser. No. 829,565

Int. Cl.[2] A23J *1/06*; A61K *37/04*

U.S. Cl. 260—122 **15 Claims**

1. A method of isolating and purifying natural immune gamma globulin for intravenous use and albumin from blood plasma, which method comprises:

(A) intimately admixing a human blood plasma product containing gamma globulin and albumin and contaminating blood proteins, lipids, lipoproteins and proteolytic enzymes with finely divided sterile fumed silica,

(B) separating the silica with adsorbed contaminating blood proteins, lipids and lipoproteins from the remaining stabilized plasma product,

(C) adjusting the pH of the stabilized plasma product to about pH 6.8 to 7.2 and the conductivity to about 5 to 7 (at 22° C),

(D) applying the stabilized plasma product to a strongly basic anion exchanger and separating purified gamma globulin therefrom,

(E) eluting the albumin from the anion exchanger by applying a buffer of about pH 4.7 to 4.9 thereto, and

(F) applying the eluted albumin to a strongly acid cation exchanger and separating purified albumin therefrom.

4,136,095

5,9α-IMINO- OR 6,9α-IMINOMETHYLENE-9-DEOXY-PGF$_1$ COMPOUNDS

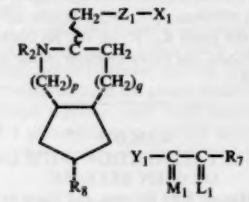
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,514, Jun. 17, 1977, Pat. No. 4,097,489. This application Apr. 5, 1978, Ser. No. 893,585

Int. Cl.[2] C07C *177/00*

U.S. Cl. 546—112 53 Claims

1. A prostacyclin analog of the formula



wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, or alkylcarbonyl of one to 4 carbon atoms, inclusive;

wherein one of p and q is the integer one and the other is the integer zero;

wherein Z_1 is

(1) $-(CH_2)_g-CH_2-CH_2-$,

(2) $-(CH_2)_g-CH_2-CF_2-$, or

(3) trans$-(CH_2)_g-CH=CH-$,

wherein g is the integer zero, one, or 2;

wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein Y_1 is

(1) trans—CH=CH—

(2) cis—CH=CH—,

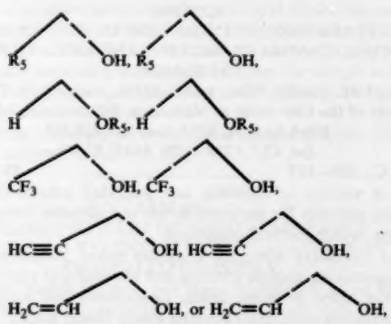
(3) $-CH_2CH_2-$,

(4) trans—CH=C(Hal)—, or

(5) —C≡C—

wherein Hal is chloro or bromo;

wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein L_1 is

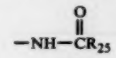
a mixture of

and

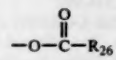
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein X_1 is

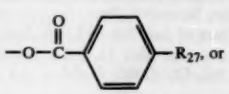
(1) $-COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



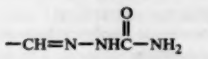
(a)



(b)



(c)



(d)

wherein R_{26} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido, inclusive; or a pharmacologically acceptable cation;

(2) $-CH_2OH$; or

(3) $-COL_4$, wherein L_4 is

(a) amino of the formula $-NR_2LR_{22}$, wherein R_{21} and R_{22} are

(i) hydrogen;

(ii) alkyl of one to 12 carbon atoms, inclusive;

(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;

(iv) aralkyl of 7 to 12 carbon atoms, inclusive;

(v) phenyl;

(vi) phenyl substitutted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;

(vii) carboxyalkyl of one to four carbon atoms, inclusive;

(viii) carbamoylalkyl of one to four carbon atoms, inclusive;

(ix) cyanoalkyl of one to four carbon atoms, inclusive;

(x) acetylalkyl of one to four carbon atoms, inclusive;

(xi) benzoylalkyl of one to four carbon atoms, inclusive;

(xii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms inclusive; hydroxy, alkoxy of one to 3 carbon atoms, inclusive; carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro;

(xiii) hydroxyalkyl of one to 4 carbon atoms, inclusive;

(xiv) dihydroxyalkyl of one to 4 carbon atoms; and

(xv) trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

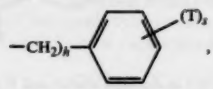
(b) carbonylamino of the formula $-NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(c) sulphonylamino of the formula $-NR_{23}SO_2R_{21}$, wherein R_{21} and R_{22} are as defined above; or

(d) hydrazino of the formula $-NR_{23}R_{24}$, wherein R_{24} is amino of the formula $-NR_2LR_{22}$, as defined above;

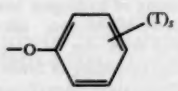
wherein R_7 is

(1) $-(CH_2)_m-CH_3$,



(2)

, or



(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when R_2 is not alkylcarbonyl and R_1 is not a pharmacologically acceptable cation.

4,136,096
6-AMINO-2,2-DIMETHYL-3-(5-TETRAZOLYL)PENAM PROCESS AND INTERMEDIATES THEREFOR

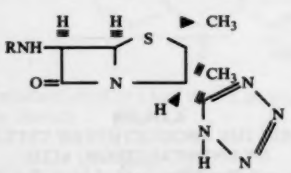
Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 772,126, Feb. 25, 1977, Pat. No. 4,081,455, which is a division of Ser. No. 691,999, Jun. 2, 1976, abandoned, which is a division of Ser. No. 503,281, Sep. 5, 1974, Pat. No. 3,992,394. This application Nov. 18, 1977, Ser. No. 852,947

Int. Cl.² C07D *277/04*

U.S. Cl. 260—306.7 R **9 Claims**

1. A process for the production of a 6-(N-protected amino)-2,2-dimethyl 3-(5-tetrazolyl)penam compound of the formula



wherein R is an amino-protecting group which comprises the step of reacting a compound of the formula

with azide ion in a reaction inert solvent in the presence of a source of acid which is sufficiently soluble in said reaction inert solvent to catalyze said reaction.

4,136,097
PROCESS AND PROMOTING AGENTS FOR THE PREPARATION OF LOWERALKYL 2-(N-R'-PYRRYL)-ALPHA-LOWERALKANOIC ACID ESTERS

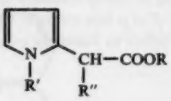
Bruce E. Maryanoff, Levittown, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 716,405, Aug. 23, 1976, abandoned. This application Apr. 6, 1977, Ser. No. 785,004

Int. Cl.² C07D *207/32*

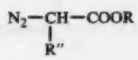
U.S. Cl. 260—326.2 **15 Claims**

1. A method for preparing a loweralkyl 2-(N-R'-pyrryl)-α-loweralkanoic acid ester of the formula

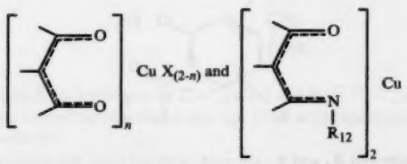


wherein R is loweralkyl; R' is selected from the group consisting of hydrogen and primary lower alkyl; R'' is selected from the group consisting of hydrogen and lower alkyl; which comprises reacting an N-R'-pyrrole of the formula

wherein R' is as above defined with a loweralkyl α-diazoloweralkanoate of the formula



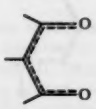
wherein R and R'' are as above defined in the presence of a copper (II) complex selected from those of formula



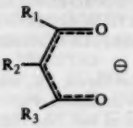
wherein:

n is an integer of from 1 to 2;

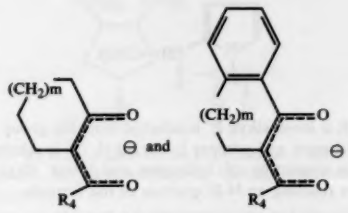
X is selected from the group consisting of anions of monoprotic strong acids, lower alkoxy radicals and a phenoxy radical;



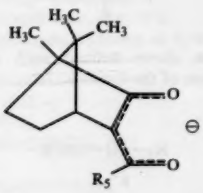
is a 1,3-diketonate or a salicylaldehyde ligand capable of forming bidentate complexes with copper (II) selected from the group consisting of (a) compounds of formula



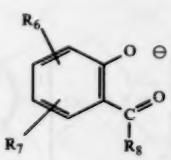
wherein R_1 and R_3 are each selected from the group consisting of loweralkyl, loweralkoxy, perfluoroloweralkyl, phenyl, 2-thienyl and β-naphthyl; and R_2 is selected from the group consisting of hydrogen and loweralkyl; (b) compounds of formula



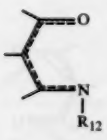
wherein R_4 is selected from the group consisting of loweralkyl, loweralkoxy, phenyl, and perfluoroloweralkyl; and m is 0 or 1; (c) compounds of formula



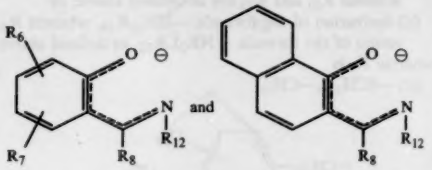
wherein R_5 is selected from the group consisting of loweralkyl and perfluoroloweralkyl; and (d) compounds of formula



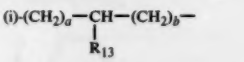
and wherein R_6 and R_7 are each selected from the group consisting of hydrogen, halo, nitro, loweralkoxy and loweralkyl; provided that said R_6 and R_7 are oriented meta to each other if both are other than hydrogen; and R_8 is selected from the group consisting of hydrogen, loweralkyl, and perfluoroloweralkyl; and



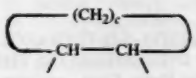
is a monoamino-1,3-diketonate or salicylaldimine ligand capable of forming bidentate complexes with copper (II) selected from the group consisting of



wherein R_6, R_7 and R_8 are as defined above and R_{12} is selected from the group consisting of hydrogen; loweralkyl; loweralkoxy; hydroxy; loweralkylamino; diloweralkylamino; phenyl substituted with from one to three members each selected from the group consisting of loweralkyl, loweralkoxy, and halo; phenylloweralkyl; phenylloweralkyl in which said phenyl is substituted with from one to three members each selected from the group consisting of loweralkyl, loweralkoxy, and halo; phenylamino, and phenylamino in which said phenyl is substituted with from one to three members each selected from the group consisting of loweralkyl, loweralkoxy, and halo; provided that the R_{12} groups on both ligands taken together may be further selected from the group consisting of



wherein a and b integers such that a + b is from 1 to 6, and R_{13} is selected from the group consisting of hydrogen, loweralkyl, phenyl, and phenyl substituted with from one to three members each selected from the group consisting of loweralkyl, loweralkoxy, and halo;



(ii)

wherein c is an integer from 3 to 5; (iii) o-phenylene or o-phenylene substituted with from one to three members each selected from the group consisting of loweralkyl, loweralkoxy, and halo; and (iv) $-(CH_2)_d-[NR_{14}-(CH_2)_e]_f-NR_{15}-(CH_2)_g-$, wherein d, e, and g are each 2 or 3, f is 0 or 1, and R_{14} and R_{15} are each selected from the group consisting of hydrogen and loweralkyl.

4,136,098

PROCESS FOR THE PRODUCTION OF CYCLIC ESTERS OF UNDECANEDIOIC ACID

Klaus Burzin, and Jörn Rüter, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels, A.G., Marl, Fed. Rep. of Germany

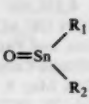
Filed Feb. 28, 1978, Ser. No. 881,932

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714564

Int. Cl.[2] C07D *321/00*

U.S. Cl. 260—343 **13 Claims**

1. A process for the production of cyclic esters of undecanedioic acid with aliphatic diols which comprises thermolyzing the corresponding linear polyesters derived from said acid and said diols, under reduced pressure at temperatures of 200°-300° C. in the presence of organotin and phosphonate catalysts wherein the organotin catalysts are of the formula



wherein R_1 and R_2 are alkyl of 1–18 carbon atoms of aryl or aralkyl each of 6–36 carbon atoms, and the phosphonate is O,O-dialkyl-(3,5-di-tert-butyl-4-hydroxybenzyl)-phosphonate, the alkyl groups of which each contain 2–18 carbon atoms.

4,136,099

PRODUCTION OF TETRAHYDROFURAN FROM 1,4-BUTANEDIOL USING TUNGSTEN ON ALUMINA CATALYSTS

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 635,730, Nov. 26, 1975, abandoned. This application Dec. 20, 1977, Ser. No. 862,584

Int. Cl.[2] **C07D** *307/08*

U.S. Cl. 260—346.11 **2 Claims**

1. An improved process for producing tetrahydrofuran by heating 1,4-butanediol at a temperature of from about 150° C. to about 350° C. in the presence of a catalyst, the improvement comprising using a heterogeneous tungsten oxide catalyst on an active support which is alumina and conducting the dehydration under pressure in the presence of hydrogen.

4,136,100

ANTHRAQUINOID DYES

Gerhard Epple, Weisenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

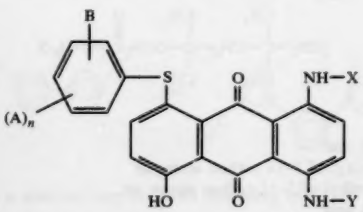
Filed Sep. 19, 1977, Ser. No. 834,411

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1976, 2644731

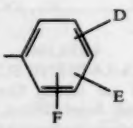
Int. Cl.[2] **C07C** *49/68;* **C09B** *1/02, 1/42*

U.S. Cl. 260—377 **10 Claims**

1. An anthraquinoid dye of the formula



where Y is saturated alkyl of 3 to 5 carbon atoms, phenyl or a radical of the formula



where D, E and F are hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine or bromine or D and E are hydrogen and F is alkoxycarbonyl (where alkoxy is of 1 to 4 carbon atoms), phenoxy, benzoylamino, trifluoromethyl or alkylcarbonyl (where alkyl is of 1 to 6 carbon atoms), and if more than one substituent is present, the substituents may be identical or different, X is

where R is saturated, linear or branched alkyl of 1 to 17 carbon atoms which is substituted by chlorine or bromine or is unsubstituted, phenylamino which is substituted by chlorine, bromine, methoxy or methyl or is unsubstituted, phenyl which is substituted by from 1 to 3 alkoxy of 1 to 4 carbon atoms, chlorine or bromine (and if more than one substituent is present these may be identical or different) or is unsubstituted, alkoxycarbonyl-alkyl (where alkoxy is of 1 to 8 carbon atoms and alkyl is of 2 to 4 carbon atoms), alkoxy of 1 to 10 carbon atoms or alkoxyalkyl of a total of 3 to 12 carbon atoms, A is chlorine, bromine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, B is hydrogen or nitro and n is 0, 1, 2 or 3 and if $n > 1$ the radicals A may be identical or different.

4,136,101

PROCESS FOR PREPARING DIALKYL (P-AMINOBENZOYL) GLUTAMATES

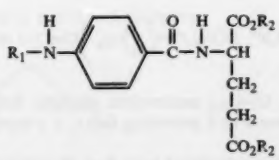
John Kazan, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 3, 1978, Ser. No. 875,051

Int. Cl.[2] **C07F** *3/06;* **C07C** *101/26*

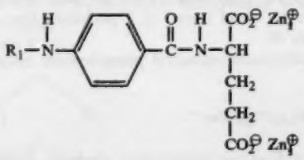
U.S. Cl. 260—429.9 **6 Claims**

1. A process for the preparation of an ester represented by formula (I):



(I)

wherein R_1 is hydrogen or C_1–C_4 alkyl and R_2 is C_1–C_4 alkyl, which comprises reacting a zinc salt of an acid represented by formula (II):



(II)

wherein R_1 is as previously identified, with a C_1–C_4 alcohol at ambient temperature in the presence of an inorganic acid to form said ester of formula (I); diluting the reaction mixture with water; clarifying the diluted reaction mixture; alkalizing said clarified reaction mixture to about pH 4–6 to precipitate said ester of formula (I); and, recovering the same.

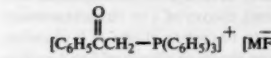
6. The compound zinc N-(p-methylaminobenzoyl)-L-(+)-glutamate.

4,136,102
PHOTOINITIATORS

James V. Crivello, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 574,006, May 2, 1975, and a continuation-in-part of Ser. No. 466,374, May 2, 1974, abandoned, and Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Apr. 21, 1973, Ser. No. 789,419
Int. Cl.[2] C07F 9/66
U.S. Cl. 260—440 7 Claims

1. Group Va salts having the formula,



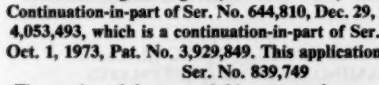
where M is an element selected from the class consisting of P, As and Sb.

4,136,103
SUBSTITUTED TETRAALKYL PHOSPHONIUM ALUMINOSILICATES

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

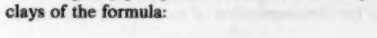
Continuation-in-part of Ser. No. 644,810, Dec. 29, 1975, Pat. No. 4,053,493, which is a continuation-in-part of Ser. No. 402,465, Oct. 1, 1973, Pat. No. 3,929,849. This application Oct. 5, 1977, Ser. No. 839,749
The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.
Int. Cl.[2] C07F 5/06
U.S. Cl. 260—448 C 27 Claims

14. Diphenylphosphino substituted tetraalkyl phosphonium clays of the formula:



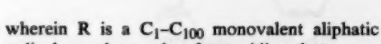
wherein R is a C_1–C_{100} monovalent aliphatic hydrocarbyl radical, x and y are 1 to 3, providing that x + y equal 4 and z is 1 to 40.

17. Dialkylamino substituted tetraalkyl phosphonium clays of the formula:



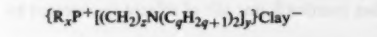
wherein R is a C_1–C_{100} monovalent aliphatic hydrocarbyl radical; q is 0 to 18; x and y are 1 to 3, providing that x plus y equal 4; z is 1 to 40.

21. Cyano substituted tetraalkyl phosphonium clays of the formula:



wherein R is a C_1–C_{100} monovalent aliphatic hydrocarbyl radical; x and y are 1 to 3, providing that x plus y are 4; z is 1 to 40.

24. Hydroxy substituted tetraalkyl phosphonium clays of the formula:



wherein R is a C_1–C_{100} monovalent aliphatic hydrocarbyl radical; x and y are 1 to 3, providing that x plus y are 4; z is 1 to 40.

4,136,104
PRODUCTION OF ACETIC ACID

H. Shinn Hwang, Livingston, and Paul D. Taylor, Clinton, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 795,260, May 9, 1977, Pat. No. 4,101,450.
This application Feb. 28, 1978, Ser. No. 882,136
Int. Cl.[2] C07C 27/06
U.S. Cl. 260—449 R 6 Claims

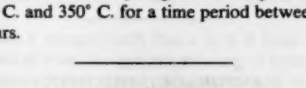
1. A process for selective conversion of synthesis gas into acetic acid and related oxygenated C_2-hydrocarbon derivatives which comprises continuously passing a carbon monoxide and hydrogen stream in contact with a rhodium-ruthenium catalyst composition in a reaction zone maintained at a temperature between about 150° C. and 500° C. and a pressure between about 100 and 10,000 psi; wherein said rhodium-ruthenium catalyst is prepared and pretreated by a method which comprises (1) co-impregnating a carrier substrate with an aqueous solution of soluble rhodium and ruthenium compounds, and subjecting the co-impregnated carrier substrate to drying conditions to remove substantially all of the water content, wherein the resultant catalyst composition consists essentially of between about 0.1 and 10 weight percent rhodium metal and between about 0.01 and 2 weight percent ruthenium metal, based on the total catalyst composition weight, (2) calcining and reducing the catalyst composition by contacting said catalyst composition with hydrogen at a temperature between about 200° C. and 500° C., and (3) subsequently heating the catalyst composition in a static atmosphere of carbon monoxide and hydrogen at a temperature between about 150° C. and 350° C. for a time period between about 0.2 and 20 hours.

4,136,105
MONOPEROXYCARBONATES

Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 427,293, Dec. 21, 1973. This application Nov. 15, 1977, Ser. No. 851,741
Int. Cl.[2] C07C 69/00; C08L 69/00
U.S. Cl. 260—453 RZ 12 Claims

1. A compound of the formula



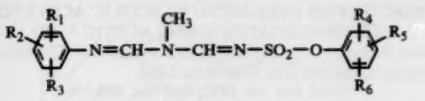
where
n is 1; and
R is alkyl of 3–16 carbon atoms or cycloalkyl of 5–12 carbon atoms; or
n is 2; and
R is alkylene of 2–12 carbon atoms or —R_1 XR —;
R_1 is alkylene of 2–6 carbon atoms; and X^1 is —O— or —S—.

4,136,106
1,3,5-TRIAZAPENTA-1,4-DIENE SULFONATE ESTERS

Manfred Böger, Weil am Rhein, Germany; Ernst Beriger, Allschwil, Switzerland; Jozef Drabek, Oberwil, Switzerland; Dieter Durr, Bottmingen, Switzerland, and Kurt Rüfenacht, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1978, Ser. No. 875,721
Claims priority, application Switzerland, Feb. 11, 1977, 1688/77; Jan. 6, 1978, 141/78
Int. Cl.[2] C07C 143/68; A61K 31/255
U.S. Cl. 260—456 A 5 Claims

1. A 1,3,5-triazapenta-1,4-diene of the formula



wherein each of R_1 to R_6 represents hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, trifluoromethyl or cyano.

4,136,107

BISORTHODINITRILES

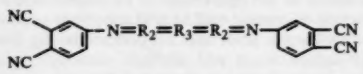
James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 681,087, Apr. 28, 1976, Pat. No. 4,057,569. This application Oct. 20, 1977, Ser. No. 843,908

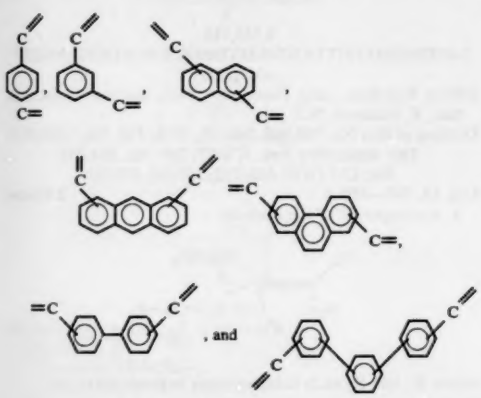
Int. Cl.² C07C *121/78*

U.S. Cl. 260—465 E **6 Claims**

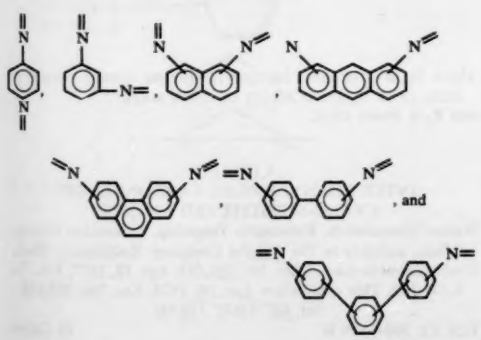
1. A bisorthodinitrile of the general formula:



wherein R_2 is selected from the class consisting of



and R_3 is selected from the class consisting of



4,136,108

PROCESS FOR THE PRODUCTION OF MALONONITRILE

Theodor Lüssling; Ferdinand Theissen, both of Gross-Auheim, and Wolfgang Weigert, Offenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 812,308, Apr. 1, 1969, Pat. No. 3,729,499. This application Oct. 4, 1972, Ser. No. 294,925

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1968, 1768154; Mar. 5, 1969, 1911174

Int. Cl.² C07C *121/22, 120/00*

U.S. Cl. 260—465.8 R **10 Claims**

1. A process for the production of malonic acid dinitrile which comprises reacting a reaction admixture consisting of acetonitrile and cyanogen chloride in the gaseous phase at a temperature between 740° and 780° C., said reaction admixture having a residence time of 1 to 15 seconds, and said cyanogen chloride and said acetonitrile being present in said reaction admixture in a molar ratio of 1:1 to 1:5.

4,136,109

INTER-OXA-12,13(E)-DIDEHYDRO-13,14-DIHYDRO-9,10-DIDEHYDRO-9-DEOXY-PGD$_1$ COMPOUNDS

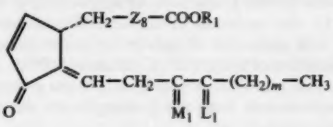
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,244, Sep. 17, 1975. This application Jun. 23, 1977, Ser. No. 809,347

Int. Cl.² C07C *177/00*

U.S. Cl. 562—503 **25 Claims**

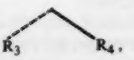
1. A prostaglandin analog of the formula



wherein m is one to 5, inclusive;
wherein M_1 is

or

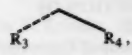
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

and

-continued



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or aklyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_8 is

(1) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(2) $-(CH_2)_2-O-(CH_2)_g-CH_2-$, or

(3) $-(CH_2)_3-O-(CH_2)_g-$,

wherein g is one, 2, or 3.

4,136,110

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron, and James R. Rege, Lakewood, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 605,363, Aug. 18, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 763,775
Int. Cl.[2] C07C *51/32*
U.S. Cl. 562—532 **10 Claims**

1. In a process for the preparation of acrylic acid or methacrylic acid by the oxidation of acrolein or methacrolein, respectively, with molecular oxygen in the vapor phase at a reaction temperature of about 200° C. to about 500° C. in the presence of an oxide catalyst, and optionally in the presence of steam, the improvement comprising using as the catalyst a catalyst of the formula:

$$A_aMo_3P_cO_x$$

wherein A is at least one element selected from the group consisting of rubidium, cesium, thallium, and potassium;
wherein a is a positive number less than about 3;
c is a positive number less than about 2;
x is the number of oxygens required by the valence state of the other elements present;
wherein said oxide catalyst is prepared in the absence of ammonia or a compound containing ammonium by:
(a) forming an aqueous slurry or suspension of molybdenum trioxide;
(b) refluxing the aqueous slurry or suspension and
(c) adding to the refluxed aqueous slurry or suspension at least one compound containing the phosphorus component and at least one compound containing the A component.

4,136,111

PROCESS FOR THE PRODUCTION OF PYRUVIC ACID

Charles F. Feldman, Fresno, Calif., assignor to Hill Brothers Chemical Company, Inc., Orange, Calif.

Filed Nov. 2, 1976, Ser. No. 738,070
Int. Cl.[2] C07C *51/38, 59/34*
U.S. Cl. 562—577 **8 Claims**

1. A process for the production of pyruvic acid comprising reacting concentrated sulfuric acid with a salt of bitartrate at a temperature from about 160° C. to about 270° C.

4,136,112

PROCESS FOR PREPARING GLYCOLIC ACID FROM FORMALDEHYDE USING ACETIC ACID

Kiran R. Bakshi, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 24, 1977, Ser. No. 809,736
Int. Cl.[2] C07C *59/06*
U.S. Cl. 562—518 **2 Claims**

1. In a process for preparing glycolic acid by the hydrogen fluoride-catalyzed reaction of formaldehyde and carbon monoxide, the improvement which comprises carrying out the reaction in the presence of acetic acid in an amount of at least 0.3 mol for each mol of formaldehyde but less than 0.5 mol of acetic acid for each mol of formaldehyde.

4,136,113

PROCESS FOR PREPARATION OF ORGANIC ACID HALIDE

James D. Johnston; Richmond M. Starrett, and Robert N. Sanders, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 28, 1977, Ser. No. 865,219
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 Y **21 Claims**

1. A process for the preparation of an organic acid chloride by contacting an organic acid or acid anhydride selected from aromatic carboxylic acids and anhydrides having from 6 to about 10 carbon atoms and aliphatic carboxylic acids and anhydrides having from 2 to about 6 carbon atoms and silicon tetrachloride in the presence of a catalytic amount of metal halide to obtain the corresponding organic acid chloride.

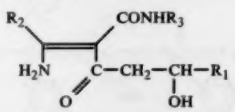
4,136,114

2-AMINOMETHYLENE-5-HYDROXY-N-ALKYL-3-OXO-AMIDES

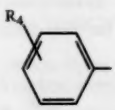
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 700,066, Jun. 25, 1976, Pat. No. 4,060,533. This application Aug. 5, 1977, Ser. No. 822,256
Int. Cl.[2] C07C *103/133, 103/22, 103/28*
U.S. Cl. 260—559 A **2 Claims**

1. A compound of the formula:



where R_1 and R_2 each independently is lower alkyl, or



where R_4 is hydrogen, halogen having an atomic weight of from 19 to 36, lower alkoxy or lower alkyl,
and R_3 is lower alkyl.

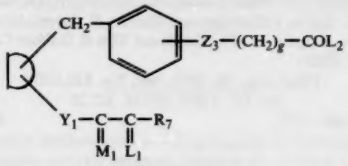
4,136,115

INTER-PHENYLENE-PG CARBONYL- OR CYANO-SUBSTITUTED AMIDES

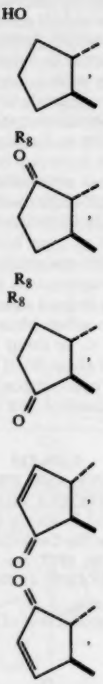
Walter Morozowich, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 788,455, Apr. 18, 1977, Pat. No. 4,100,192. This application Apr. 20, 1978, Ser. No. 898,253
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—559 R **50 Claims**

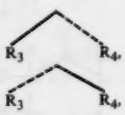
1. A prostaglandin analog of the formula



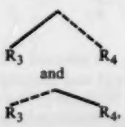
wherein D is



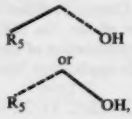
wherein R_8 is hydrogen or hydroxy;
wherein Y_1 is
(1) trans-CH=CH—,
(2) cis—CH=CH—, or
(3) $—CH_2CH_2—$,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene, with the proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein L_1 is



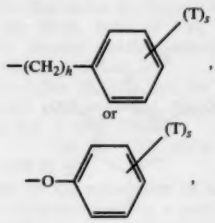
or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl; wherein R_7 is
(1) $—(CH_2)_m—CH_3$,



wherein h is zero to 3, inclusive, wherein m is one to 5, inclusive, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl; and
wherein L_2 is
amino of the formula $—NR_{21}R_{22}$, wherein one R_{21} and R_{22} is hydrogen or alkyl of one to 12 carbon atoms, inclusive; and the other of R_{21} and R_{22} is
(i) phenyl substituted with zero, one, or 2 nitro, chloro, alkyl of one to 3 carbon atoms, inclusive, or hydroxy and at least one but not more than three carboxy or alkoxycarbonyl of one to 4 carbon atoms, inclusive, with the overall proviso that there be not more than 3 substituents;
(ii) carboxyalkyl of one to 4 carbon atoms, inclusive;
(iii) carbamoylalkyl of one to four carbon atoms, inclusive,
(iv) cyanoalkyl of one to 4 carbon atoms, inclusive;
(v) acetylalkyl of one to 4 carbon atoms, inclusive;
(vi) benzoylalkyl of one to 4 carbon atoms, inclusive, or
(vii) benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro.

4,136,116

TRICYCLIC COMPOUNDS

Emilio Kyburz, Reinach, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 270,674, Jul. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 818,146, Apr. 21, 1969, abandoned. This application Mar. 14, 1975, Ser. No. 558,609

Int. Cl.[2] **C07L** *87/05*

U.S. Cl. 260—570.8 **1 Claim**

1. The compound, 1-methyl-5-(3-dimethylaminopropylidene)-5H-dibenzo[a,d]cycloheptene-N-oxide.

4,136,117

PREPARATION OF 2,6-DINITROANILINES

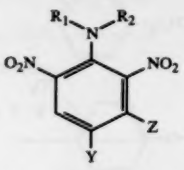
Robert E. Diehl; Stephen D. Levy, both of Lawrenceville, and William H. Gastrock, Hightstown, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 565,885, Apr. 7, 1975, abandoned, which is a continuation of Ser. No. 373,077, Jun. 25, 1973, abandoned. This application Mar. 14, 1977, Ser. No. 777,496

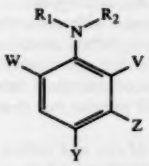
Int. Cl.[2] C07C *85/24, 85/26*

U.S. Cl. 260—577 18 Claims

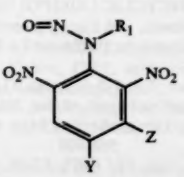
1. A method for the manufacture of a compound of the formula:



wherein Y is alkyl C_1–C_4, halogen or CF_3; Z is hydrogen, halogen, alkyl C_1–C_4, alkoxy C_1–C_4, monohaloalkyl C_1–C_4, or monoalkoxy (C_1–C_4) alkyl (C_1–C_4); R_1 represents alkyl C_1–C_6, cycloalkyl C_4–C_6, monohaloalkyl C_1–C_4 or alkoxyalkyl where the alkyl group is C_1–C_4 and the alkoxy group is C_1–C_4; R_2 is hydrogen or one of the groups of R_1; comprising reacting an N-alkylated aniline of the formula:



wherein R_1, R_2, Y and Z are as defined above and W and V are hydrogen or nitro provided W and V are not both nitro; with a three-component nitrating agent having a composition with the following limits: 60% HNO_3, 8% H_2SO_4, 32% H_2O; 50% HNO_3, 35% H_2SO_4, 15% H_2O; 2% HNO_3, 68% H_2SO_4, 30% H_2O; 2% HNO_3, 20% H_2SO_4, 78% H_2O; at a temperature in the range of from 0° C. to 70° C.; further characterized in that, when W and V are hydrogen in the N-alkylated aniline, from 2.2 to 5.0 moles of nitric acid are employed per mole of the N-alkylated aniline and, when one of W and V in the N-alkylated aniline is nitro, the moles of nitric acid per mole of N-alkylated aniline is in the range of 1.2 to 4.0 moles and when a compound of the formula:



wherein R_1 Y and Z are as defined above is formed in the reaction mixture denitrosating the reaction mixture.

4,136,118

METHOD OF PREPARING 2,2'-DITHIODIANILINE

Donald E. Smith, Tallmadge, and Charles B. Jones, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 19, 1977, Ser. No. 826,020

Int. Cl.[2] C07C *85/24, 85/26*

U.S. Cl. 260—578 3 Claims

1. A method of preparing 2,2'-dithiodianiline which comprises (A) forming an agitated, unstable mixture comprised of (1) 100 parts by weight of an aqueous solution comprising about 10 to about 50 weight percent sodium or potassium salt of o-aminothiophenol, and correspondingly, about 90 to about 50 weight percent water and (2) a dispersion therein of about 10 to about 50 parts by weight hydrocarbon selected from at least one of toluene, benzene or xylene, (B) oxidizing said salt of o-aminothiophenol by adding a water soluble peroxide to said agitated dispersion sufficiently slowly so that only a trace, if any, residual peroxide concentration is maintained in the dispersion, at a temperature in the range of about 5° C. to about 50° C., to form products including inorganic salts, sodium or potassium hydroxide and substantially water insoluble, yet hydrocarbon-soluble, 2,2'-dithiodianiline, (C) discontinuing said agitation to essentially immediately yield a sharply defined lower aqueous phase and an upper hydrocarbon phase containing said 2,2'-dithiodianiline essentially exclusive of the remainder of said products contained in said aqueous phase, (D) drawing off said sharply defined aqueous phase and (E) distilling the remaining hydrocarbon phase to a pot temperature in the range of about 130° C. to about 150° C. under a reduced pressure in the range of about 50 to about 200 millimeters of mercury to remove said hydrocarbon solvent as a distillate and recover said 2,2'-dithiodianiline as a distilland.

4,136,119

M-MENTHENONE AND PROCESS FOR ITS PRODUCTION

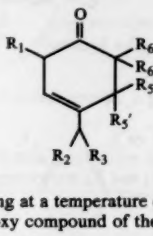
George L. K. Hunter, and Benjamin C. Clark, Jr., both of Atlanta, Ga., assignors to The Coca-Cola Company, Altanta, Ga.

Filed Dec. 30, 1977, Ser. No. 865,829

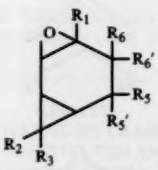
Int. Cl.[2] C07C *45/00, 45/22*

U.S. Cl. 260—586 R 35 Claims

1. A process for the production of a cyclohex-3-en-1-one of the formula



comprising contacting at a temperature of from about 0° C to about 130° C an epoxy compound of the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of methyl, ethyl, n-propyl and isopropyl, and where R_5, R_5', R_6 and R_6' are selected from the group consisting of hydrogen, methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl and t-butyl, phenyl, cyclohexyl and a 5,6 fused six membered ring, in a dry inert organic solvent with an effective amount of a Lewis

acid for a time sufficient to produce said cyclohex-3-en-1-one having R_1, R_2, R_3, R_5, R_5', R_6 and R_6' substituents identical to those selected for said epoxy compound.

4,136,120

PROCESS FOR THE PREPARATION OF BUTENOYL NORBORNENES

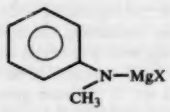
Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Schuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,141

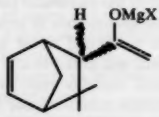
Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 G **1 Claim**

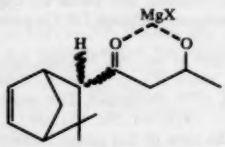
1. A process for preparing a norbornane derivative which comprises the steps of (i) reacting 2-acetyl-3,3-dimethyl-5-norbornene with a compound having the structure:



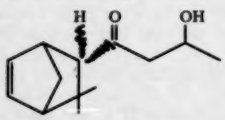
wherein X is selected from the group consisting of chlorine, bromine or iodine thereby forming a first organometallic compound having the structure:



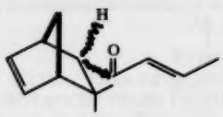
(ii) admixing the first organometallic compound thus formed with acetaldehyde thereby forming a second organometallic compound having the structure:



(iii) hydrolyzing said second organometallic compound to form a keto alcohol having the structure:



(iv) reacting said keto alcohol with a mixture of either an alkanoic metal acetate and acetic anhydride or paratoluenesulfonic acid in benzene or toluene thereby forming endo-2-(2'-butenoyl)-3,3-dimethyl-5-norbornene having the structure:



("cis" and/or "trans")

4,136,121

PROCESS FOR THE PREPARATION OF FLUORINE-CONTAINING KETONES

Thomas Martini, Bad Soden am Taunus, and Friedhelm Kluge, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 20, 1977, Ser. No. 844,049

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648123; Feb. 4, 1977, 2704607

Int. Cl.[2] C07C *49/04*

U.S. Cl. 260—593 H **4 Claims**

1. A process for the preparation of aliphatic perfluoroketones, which comprises reacting a perfluorocarboxylic acid salt of the formula

$$R_1 - CO_2M \qquad II$$

wherein M is a metal selected from the group consisting of Li, Na, K, Rb, Cs, Ag and R_1 is a perfluoroalkyl radical having of from 2 to 50 carbon atoms, which radical may contain in addition one or more ether oxygen linkages, with a perfluorocarboxylic acid fluoride of the formula

$$R_2 - COF \qquad III$$

wherein R_2 is a perfluoroalkyl radical having of from 1 to 50 carbon atoms, which radical may contain in addition one or more ether oxygen linkages, in an aprotic-polar solvent at a temperature of from 20° to 200° C. to form a ketone of the formula R_2COR_3 wherein R_3 is selected from R_1 and isomers of R_1.

4,136,122

SEPARATION OF 2,6-DICHLOROBENZALDEHYDE FROM ISOMERIC MIXTURES

Byron R. Cotter, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,594

Int. Cl.[2] C07C *45/24*

U.S. Cl. 260—599 **12 Claims**

1. A process for the separation of 2,6- dichlorobenzaldehyde from mixture of dichlorobenzaldehyde isomers which comprises dissolving the mixture of isomers in a water-immiscible, chemically inert organic solvent, contacting the resultant organic solution with an aqueous sodium bisulfite solution, and separating the resultant aqueous and organic phases.

4,136,123

USE OF WATER SOLUBLE METALLO PHTHALOCYANINES AS OXIDATION CATALYSTS

David A. Hutchings, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 22, 1974, Ser. No. 490,424

Int. Cl.[2] C07C *179/04*

U.S. Cl. 568—565 **5 Claims**

1. In the hydroperoxide oxidation of an aromatic compound having the general structural formula (I)

wherein R^1 and R^2 are the same or different radicals selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 6 carbon atoms, or R^1 and R^2 can be taken together to form a cycloalkyl ring having from 4 to 7 carbon atoms, A is an aromatic nucleus and R^3 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 6 carbon atoms, halo radicals, acetyl radicals and methoxy radicals in the presence of a metallo phthalocyanine catalyst at a temperature of from 50° C. to 150° C. at a pressure of from atmospheric pressure to 500 pounds per square inch gauge oxygen partial pressure, the improvement comprising first rendering the metallo phthalocyanine catalyst water soluble by sulfonation using a combination of a material selected from the group consisting of (A) chlorosulfuric acid or (B) sulfuric acid monohydrate combined with fuming sulfuric acid.

4,136,124

MANUFACTURE OF DIALKYL-KETALS

Helmut Zinke-Allmang, Bad Durkheim, and Walter Scheidmeir, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,718

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636278

Int. Cl.[2] C07C *41/00*

U.S. Cl. 568—591 **6 Claims**

1. In a process for the manufacture of a dialkylketal by reacting a ketone with an alkanol in the presence of an acid condensing agent, wherein the improvement comprises:

carrying out the reaction in the presence of at least an equivalent amount, based on the ketone, of anhydrous calcium sulfate and in the presence of from 0.5 to 2 liters of a hydrocarbon or hydrocarbon mixture per liter of the ketone/alkanol mixture.

4,136,125

PREPARATION OF BIS(PENTACHLOROCYCLOPENTADIENYL)

Dennis C. Pelletier, Fall River, Mass., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Dec. 21, 1977, Ser. No. 863,028

Int. Cl.[2] C07C *17/00*

U.S. Cl. 260—648 R **10 Claims**

1. A process for the preparation of bis(pentachlorocyclopentadienyl) which comprises the steps of

(a) reductively coupling hexachlorocyclopentadiene by reaction with cuprous chloride in an alcohol reaction medium;

(b) extracting the bis(pentachlorocyclopentadienyl) product from the reaction medium by addition thereto of an organic solvent that is immiscible with the alcohol, and allowing the alcohol and organic solvent to settle, forming two phases;

(c) separating the alcohol phase;

(d) treating the organic solvent to extract unreacted cuprous chloride therefrom by addition of hydrochloric acid having a strength of at least about 0.4 normal, and allowing the organic solvent and hydrochloric acid to separate, forming two phases; and

(e) recovering the bis(pentachlorocyclopentadienyl) product from the organic solvent phase.

4,136,126

PREPARATION OF β-PHELLANDRENE

Linda M. Hirschy, Jacksonville; Bernard J. Kane, Atlantic Beach, and Sean G. Traynor, Jacksonville, all of Fla., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 15, 1978, Ser. No. 886,659

Int. Cl.[2] C07C *1/22*

U.S. Cl. 260—666 A **11 Claims**

1. A process for making β-phellandrene comprising: heating a para-menth-1-ene-7-sulfonate salt at about 150° to about 350° C under non-acidic conditions until said β-phellandrene is formed.

4,136,127

DEHYDROGENATION METHOD AND MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 810,321, Jun. 27, 1977, which is a continuation-in-part of Ser. No. 713,020, Aug. 9, 1976, Pat. No. 4,036,742, which is a continuation-in-part of Ser. No. 656,925, Feb. 10, 1976, Pat. No. 4,025,418, which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,059. This application Aug. 25, 1977, Ser. No. 827,651

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] C07C *5/40*

U.S. Cl. 260—668 D **18 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, about 0.1 to about 5 wt. % cobalt, and about 0.001 to about 1 wt. % germanium; wherein the platinum group metal, rhenium, catalytically available cobalt and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,136,128

CATALYTIC ALKYLATION/TRANSALKYLATION

Werner O. Haag, Trenton, and David H. Olson, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 580,864, May 27, 1975, Pat. No. 4,070,407, which is a continuation-in-part of Ser. No. 449,315, Mar. 8, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,334

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] C07C *3/52, 3/62*

U.S. Cl. 260—671 R **15 Claims**

1. A process for effecting alkylation of an aromatic hydrocarbon charge selected from the group consisting of aromatic hydrocarbons and aromatic hydrocarbons containing a nonpolar substituent which comprises contacting said hydrocarbon charge with an alkylating agent under conditions effective for accomplishing said alkylation including a reactor inlet temperature between about 37° C. and about 650° C., a reactor pressure between atmospheric and about 3000 psig, a mole ratio of of hydrocarbon charge to alkylating agent in the approximate range of 1:3 to 20:1 and a weight hourly space velocity between about 0.5 hr^{-1} and 1000 hr^{-1} in the pressure presence of a catalyst comprising a crystalline aluminosilicate

zeolite or a product of thermal treatment thereof at a temperature of from about 100° C. to about 800° C., said zeolite being selected from the group consisting of ZSM-35, ZSM-38 and a combination thereof.

4,136,129

STEAM DEALKYLATION

Tansukhlal G. Dorawala, Wappingers Falls, and Russell R. Reinhard, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 610,806, Sep. 5, 1975, abandoned. This application Nov. 10, 1977, Ser. No. 850,120

Int. Cl.[2] C07C *3/58*

U.S. Cl. 260—672 R **11 Claims**

1. The method of steam dealkylating an alkylaromatic hydrocarbon charge which comprises

passing a mixture consisting essentially of steam and an alkylaromatic hydrocarbon for 0.5–3 minutes at steam dealkylating conditions at 600° F.–950° F. into into a bed wherein it is in contact with an activated supported catalyst having an initial activity comprising oxides of (i) a Group VIII metal and (ii) a Group I A metal thereby forming a product gas containing dealkylated alkylaromatic hydrocarbon during a reaction period, said catalyst having been initially activated by maintaining it in a hydrogen atmosphere at 650° F.–1400° F. for 2–30 hours whereby the activated catalyst contains 15–100 mole % of the Group VIII metal in the form of metal and the remainder in combined form;

interrupting said reaction period by decreasing the flow of hydrocarbon when the catalyst activity has decreased to a level above about 80% of its initial activity as measured by the mole % conversion of charge alkylaromatic hydrocarbon;

contacting said catalyst in said bed for 0.5–15 minutes with steam during a regeneration period, at substantially the same conditions of temperature prevailing during said reaction period, during which the activity of said catalyst increases to at least about 90% of its initial activity thereby forming regenerated catalyst;

passing a mixture of steam and charge alkylaromatic hydrocarbon for 0.5–3 minutes into contact with said regenerated catalyst thereby forming product gas containing dealkylated alkylaromatic hydrocarbon during a subsequent reaction period; and

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4,136,130

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 758,616, Jan. 12, 1977, Pat. No. 4,087,381, which is a division of Ser. No. 633,890, Nov. 20, 1975, Pat. No. 4,024,052. This application Apr. 7, 1978, Ser. No. 894,201

Int. Cl.[2] C07C *5/40, 15/08;* B01J *23/10, 23/94*

U.S. Cl. 260—673.5 **30 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % lanthanide series metal and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and lanthanide series metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the lanthanide series metal is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,136,131

EXTRACTION OF RUBBER OR RUBBERLIKE SUBSTANCES FROM FIBROUS PLANT MATERIALS

Russell A. Buchanan, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 31, 1978, Ser. No. 891,953

Int. Cl.[2] C08C *4/00*

U.S. Cl. 260—816 G **6 Claims**

1. A process for extracting polymeric hydrocarbon substances, selected from the group consisting of rubber and rubberlike polymeric hydrocarbons, from fibrous plant materials containing the same, comprising the following steps:

a. subjecting said plant materials to the simultaneous action of compressive and shear forces under nonaqueous conditions, wherein said forces are sufficient to reduce said fibrous plant material to comminuted fibrous matter and released polymeric hydrocarbon substances and to cause the comminuted fibrous matter and polymeric hydrocarbon substances to cohere into a plastic mass, and thereby producing said plastic mass;

b. shaping the plastic mass into particles;

c. extracting the polymeric hydrocarbon substances from the shaped particles with a solvent; and

d. recovering said polymeric hydrocarbon substances.

4,136,132

MANUFACTURE OF EXTRUDED PRODUCTS

Michael J. Poole, London, England, assignor to BICC Limited, London, England

Filed Sep. 13, 1976, Ser. No. 722,545

Claims priority, application United Kingdom, Sep. 26, 1975, 39606/75

Int. Cl.[2] C08F *255/02*

U.S. Cl. 260—827 **13 Claims**

1. A method of making a cross-linked extruded product comprising: metering into a first screw extrusion machine a polymer capable of being cross-linked by the use of hydrolysable unsaturated silane together with compounding ingredients comprising a hydrolysable unsaturated silane, a free-radical generator and a silanol condensation catalyst; blending said compounding ingredients with said polymer in the barrel of said first extruder to form a homogeneous mixture at a temperature low enough to avoid substantial grafting of silane groups to the polymer; feeding said mixture directly without exposure to the atmosphere to a second screw extrusion machine and raising its temperature sufficiently in said second extrusion machine to effect grafting of silane groups to the polymer, the amount of free-radical generator being sufficiently low to limit direct free-radical cross-linking to a level compatible with extrusion of the material; after said grafting extruding said mixture from said second extruder through an extrusion die to form an elongate shaped product; and cross-linking said polymer in said shaped product by the action of moisture.

4,136,133

BLOCK COPOLYMER OF POLY (OXA-AMIDE) AND POLYAMIDE

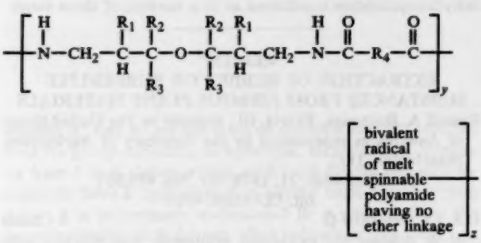
Robert M. Thompson, Wilmington, Del., assignor to Sun Ventures, Inc., Radnor, Pa.

Continuation-in-part of Ser. No. 562,621, Mar. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 415,583, Nov. 14, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,364

Int. Cl.[2] C08L *77/06*

U.S. Cl. 260—857 TW **47 Claims**

1. A block copolymer having a molecular weight of about 5000–100,000 and the following repeating structural formula:



wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls;

R_4 is selected from the group consisting of C_0–C_{10} alkylenes and C_3–C_{10} isoalkylene; and

y = 4–200

z = 4–200.

4,136,134

FAST ACTING POLYESTER ADHESIVE SYSTEMS AND METHOD OF USE

Anthony C. Plaisted, North Royalton, Ohio, assignor to Celtite, Inc., Cleveland, Ohio

Filed Feb. 28, 1977, Ser. No. 773,084

Int. Cl.[2] C08L *67/06;* C09J *3/16*

U.S. Cl. 260—861 **6 Claims**

1. A fast acting polyester adhesive system including solutions of unsaturated polyester resin in ethylenically unsaturated monomers and a catalyst paste therefor, the improvement being in providing as said catalyst paste the combination of an unsubstituted benzoyl peroxide, a halogen substituted benzoyl peroxide and a major amount of filler and plasticizer for said polyester, said halogen substituted benzoyl peroxide being selected from the group consisting of 2,4 dichloro benzoyl peroxide, and parachloro benzoyl peroxide, said halogen substituted benzoyl peroxide being present in said paste in an amount by weight of from 1 to 15% and said unsubstituted benzoyl peroxide being present in said paste in an amount greater than said substituted benzoyl peroxide.

4,136,135

STYRENE/MALEIC ANHYDRIDE COPOLYMERS

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1977, Ser. No. 773,888

Int. Cl.[2] C08L *11/00, 23/28, 35/06*

U.S. Cl. 260—874 **12 Claims**

1. A polymer composition with reduced combustibility which comprises:

A. from 40 to 60 parts of a styrene/maleic anhydride copolymer;

B. from 1 to 30 parts of a halogen-containing rubber selected from the group consisting of homopolymers and copolymers of chloroprene, epichlorohydrin rubber and chlorinated polyethylene;

C. from 7.5 to 15 parts of a halogenated aromatic flame retardant additive;

D. from 1 to 15 parts of a metal oxide flame retardant synergist; and

E. a total of from 15 to 25 parts of a smoke suppressant combination consisting of from 2 to 10 parts each of

(i) dawsonite,

(ii) calcium oxide, and

(iii) a magnesium compound selected from magnesium carbonate, magnesium borate and magnesium oxide,

wherein the total number of parts of (ii) is at least one quarter the sum of the parts of (i), (ii) and (iii), all parts being by weight of the polymer composition.

4,136,136

GRAFT COPOLYMERS OF HYDROCARBONS AND SMALL RING HETEROCYCLIC COMPOUNDS AND PROCESS FOR THE PREPARATION THEREOF

Patricia Dreyfuss, Bath, and Joseph P. Kennedy, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Filed Jun. 14, 1976, Ser. No. 695,368

Int. Cl.[2] C08L *23/00, 27/00*

U.S. Cl. 260—878 R **29 Claims**

1. A graft copolymer product comprising:

a halogenated backbone selected from the group consisting of saturated and unsaturated polymers devoid of oxygen, sulfur and nitrogen in the main chain; and

a plurality of graft branches of polymer from an unhalogenated cationically polymerizable heterocyclic compound selected from the group consisting of cyclic ethers having three-, four-, five-, seven- and larger membered rings; cyclic formals having five-, seven- and eight-membered rings; cyclic lactones having from four-to-and-eight-membered rings; cyclic sulfides having three-, four-, six- and seven-membered rings; cyclic amines having three-membered rings and bicylic compounds.

4,136,137

BLOCK COPOLYMERS

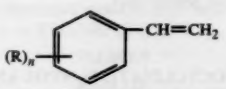
Henry L. Hsieh, and Floyd E. Naylor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 636,488, Dec. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 141,996, May 10, 1971, abandoned. This application May 8, 1978, Ser. No. 904,121

Int. Cl.[2] C08F *293/00*

U.S. Cl. 260—880 B **8 Claims**

1. A rubbery radial block copolymer consisting essentially of a conjugated diene containing 4 to 12 carbon atoms per molecule, styrene, and a hydrocarbyl-substituted styrene of the formula



wherein R is a hydrocarbyl radical containing 1 to 12 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl, and combinations thereof and n is an integer having a value within the range of 1 to 5, said rubbery block copolymer having an inherent viscosity within the range of from about 0.5 to about 3 and being represented by the general formula $(A — B)_xZ$ wherein A is a resinous (nonrubbery) polymer block of styrene and hydrocarbyl-substituted styrene, B is a rubbery polymer block of conjugated diene, Z is a residue from a coupling agent, and x is greater than 2 and represents the number of (A — B—) polymer blocks coupled together, and wherein said block copolymer, based on 100 parts by weight of copolymer, contains from about 50 to about 90 parts by weight of said conjugated diene and from about 50 to about 10 parts by weight of said styrene and hydrocarbyl-substituted styrene and the amount of said hydrocarbyl-substituted styrene to the total of said conjugated diene, styrene, and hydrocarbyl-substituted styrene is within the range of from about 1 to about 20 parts by weight of said hydrocarbyl-substituted styrene per 100 parts by weight of the total of said conjugated diene, styrene, and hydrocarbyl-substituted styrene.

4,136,138
CYANOACRYLATE DENTAL ADHESIVE COMPOSITIONS

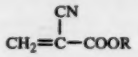
John R. Dombroski, Kingsport, and Diane M. Stoakley, Church Hill, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 23, 1976, Ser. No. 708,160
Int. Cl.[2] C08L *33/14*
U.S. Cl. 260—881 8 Claims

1. A solidified adhesive compound exhibiting hydrolytic stability which solidified adhesive compound results from combining components A, B and C as follows:

A. a polymerizable monomeric 2-cyanoacrylate portion of

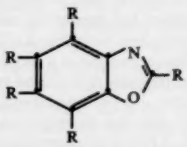
1. from 60 to 90 parts by weight of allyl 2-cyanoacrylate;
2. from 3 to 25 parts by weight of an alkyl 2-cyanoacrylate having the formula



wherein R is alkyl having 6 to 10 carbon atoms;

3. from 0.25 to 5 parts by weight of a difunctional monomer diester of an acid from the group consisting of acrylic and methacrylic acid and a diol having an aromatic nucleus; and
4. from 3 to 15 parts by weight of a 2-cyanoacrylate compatible polymeric thickener;

B. from 0.05 to about 1.5 weight percent based upon the weight of component A of a cyclic imino initiator selected from the group consisting of 2,4,6-tri(allyloxy)-S-triazine, 2,4,6-tri(alkyloxy)-S-triazines having 1 to about 20 exocyclic carbon atoms; and benzoxazoles having the formula



wherein each R is the same or different and represents hydrogen, phenyl, alkyl of 1 to about 20 carbon atoms, chloro or bromo; and

C. an amount of an organic peroxide free radical providing compound sufficient to cause crosslinking of the difunctional monomer diester with the 2-cyanoacrylates.

4,136,139
VARIABLE VENTURI TYPE CARBURETOR

Norihiko Nakamura, Mishima; Takaaki Itou, and Kazuo Kikuchi, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Col., Ltd., Obu, both of, Japan

Filed Mar. 3, 1977, Ser. No. 773,935
Claims priority, application Japan, Dec. 16, 1976, 51-150281
Int. Cl.[2] F02M *7/24*
U.S. Cl. 261—44 C 1 Claim

1. A variable venturi type carburetor, comprising;

a housing,

a bore extending through said housing and having an inner wall defining an intake passage,

a suction piston movably mounted in said housing and having a bottom end face projecting into said intake passage, said bottom end face of said suction piston and said inner wall of said intake passage defining a venturi, said suction piston moving up and down in response to a change in the vacuum produced in said intake passage located downstream of said venturi for maintaining the velocity of air flowing into said venturi at a constant value,

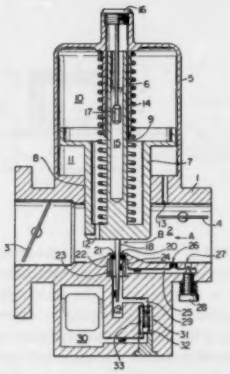
a jet disposed on the inner wall of said intake passage at a position facing against said bottom end face of said suction piston,

a needle fixed onto said bottom end face of said suction piston and entering into said jet, said jet and said needle defining an annular opening through which fuel is injected into said intake passage,

a fuel reservoir in said housing;

a fuel supply passage disposed in said housing and communicating said fuel reservoir with said jet,

a pressure reducing device being disposed in said fuel supply passage for decreasing the pressure of the fuel contained in



said fuel passage located between said jet and said pressure reducing device, said pressure reducing device comprising a check valve which only allows the outflow of fuel from said reservoir to said jet,

an air bleed passage communicating said fuel supply passage with the atmosphere, and

a bubble generating pipe made of sintered metal and disposed in said fuel passage at a position in which said air bleed passage opens into said fuel supply passage for creating fine bubbles of air in the fuel contained in said fuel supply passage.

4,136,140
MOLDABLE FOAMED POLYMER COMPOSITION AND A PROCESS THEREFOR

Roy Worrall, Newport, Wales, assignor to Monsanto Limited (Monsanto Chemicals Ltd.), London, England

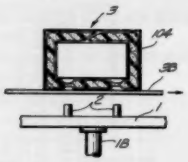
Division of Ser. No. 360,882, May 16, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,068
Claims priority, application United Kingdom, Jun. 8, 1972, 26737/72
Int. Cl.[2] B29C *1/08*
U.S. Cl. 264—42 11 Claims

1. A process for producing a concrete structure having portions defining at least one open void which comprises molding a composition of a wax and particles of foamed polymer (said particles being smaller than said open void), said wax being present in an amount sufficient to bond the particles together, into a coherent molded article in the shape of said open void, placing said molded article in a mold having the required shape for said concrete structure, flowing concrete around said molded article in said mold such that at least a portion of said molded article is a portion of an outer face of said concrete structure, curing said concrete structure and removing said moldable composition from said concrete structure with a hot medium selected from the group consisting of water, steam and air or mixtures thereof, (at a temperature of from about 30 to 100° C., wherein said wax is melted and said foamed particles floated from said open void.

4,136,141
METHOD OF CUSHIONING COMMODITIES IN CONTAINERS WITH FOAMED IN PLACE CELLULAR PLASTIC MATERIAL

Udo Bauer, Nuremberg; Jürgen Nothdurft, Behringersdorf, and Willi Langer, Neudorf, all of Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Fed. Rep. of Germany

Filed Apr. 6, 1977, Ser. No. 785,116
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1976, 2616023
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—45.2 10 Claims



1. A method of cushioning commodities in cartons, boxes or analogous prefabricated containers, comprising the steps of introducing a commodity into an empty prefabricated container; supporting the commodity from the outside of the container by at least one distancing element which extends into the container to maintain the commodity in a position in which at least a substantial portion of the external surface of the commodity is spaced apart from the internal surface of the container; introducing the foamable constituents of a cellular plastic material between said surfaces; foaming the thus introduced constituents in place so that the resulting cushion at least substantially fills the space between said surfaces; and terminating said supporting step when the cushion is sufficiently stable to maintain the commodity in said position, said terminating step including withdrawing the distancing element from the container.

4,136,142
PROCESS FOR EXTRUDING STABILIZED EXPANDED POLYSTYRENE COMPOSITION

Brian Hargreaves, and Michael H. Richmond, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

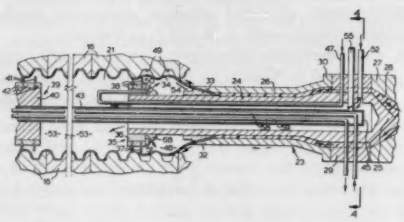
Filed Mar. 23, 1977, Ser. No. 780,500
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—53 3 Claims

1. A process of preparing expanded polystyrene which comprises preparing a foam extruder feed material comprising from about 20 to about 50 parts by weight of solid pellets of previously expanded recycle foam polystyrene, said recycle polystyrene having been reduced from expanded foam by compaction and extrusion at temperatures in the 400°–550° F. range and by repelletization, and from about 80 to about 50 parts by weight of pellets of virgin polystyrene; and from about 0.01 to about 0.5 parts by weight of 1,1,3-tris(2-methyl-4-hydroxy-5-tertiary butyl phenyl) butane and from about 0.02 to about 1.0 parts by weight of tris(mixed mono- and dinonyl phenyl) phosphite; feeding said feed material to a first stage being an extruder operating at temperatures of from 400°–550° F. so as to melt and homogeneously mix the feed material; adding blowing agent to said molten material in the first stage, and dispersing the blowing agent within the molten material therein; feeding the material to a second stage being a section of said extruder or a second extruder operating at lower temperatures so as to cool the feed material to temperatures of from about 230°–315° F.; and extruding the material from said second stage through a die, at a temperature of from about 230°–215° F., and foaming the extrudate.

4,136,143
APPARATUS FOR AND METHOD OF PRODUCING CORRUGATED THERMOPLASTIC TUBING

Gerd P. H. Lupke, 46 Stornoway Cres., and Manfred A. A. Lupke, 35 Ironside Cres., both of Thornhill, Ontario, Canada

Filed Feb. 22, 1977, Ser. No. 770,664
Int. Cl.[2] B29D *23/03*
U.S. Cl. 264—508 10 Claims

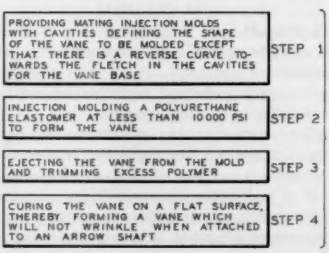


1. Apparatus for producing corrugated thermoplastic tubing, the apparatus comprising a pair of complementary mold assemblies each of which has an endless array of articulately interconnected mold blocks, drive means for driving the mold blocks of each mold assembly in synchronism with the mold blocks of the other mold assembly along a forward run in which the mold blocks of the mold assemblies are in cooperative interengagement to provide an axially extending tubular mold tunnel having a corrugated wall, and back along a return run, an extrusion head disposed at the entrance to the tubular mold tunnel for forming a tube of thermoplastic material, and gas supply means for supplying pressurized gas at a first pressure to a first zone within the tube of thermoplastic material in the tubular mold tunnel for supporting said tube against the cooperatively interengaged mold blocks forming the tunnel, and for supplying pressurized gas at a second pressure which is higher than said first pressure to a second zone within the tube of thermoplastic material in the tubular mold tunnel for urging said tube outwardly into the corrugations in the wall of the tubular mold tunnel, a first sealing arrangement separating the first zone which is disposed adjacent to the extrusion head from the second zone which is disposed downstream of the first zone, and a second sealing arrangement defining the downstream end of the second zone.

4,136,144
ARROW VANE AND METHOD FOR THE PREPARATION THEREOF

Richard R. Munger, Charlotte, Mich., assignor to MW Industries, Inc., Potterville, Mich.

Continuation of Ser. No. 714,091, Aug. 13, 1976, abandoned. This application Feb. 17, 1978, Ser. No. 878,680
Int. Cl.[2] B29F *1/00, 1/14*
U.S. Cl. 264—161 8 Claims


PROVIDING MATING INJECTION MOLDS WITH CAVITIES DEFINING THE SHAPE OF THE VANE TO BE MOLDED EXCEPT THAT THERE IS A REVERSE CURVE TOWARDS THE FLETCH IN THE CAVITIES FOR THE VANE BASE
STEP 1
INJECTION MOLDING A POLYURETHANE ELASTOMER AT LESS THAN 10000 PSI TO FORM THE VANE
STEP 2
EJECTING THE VANE FROM THE MOLD AND TRIMMING EXCESS POLYMER
STEP 3
CURING THE VANE ON A FLAT SURFACE, THEREBY FORMING A VANE WHICH WILL NOT WRINKLE WHEN ATTACHED TO AN ARROW SHAFT
STEP 4

1. The method of injection molding a vane for arrow shafts of a thermoplastic elastomeric polyurethane polymer wherein

the vane includes a solid fletch defined by a curved outer edge and projecting from the point of a V shaped base with an obtuse inside V angle which attaches to the arrow shaft, the fletch having a cross-section which tapers away from the point of the V towards the edge of the fletch such that the fletch can wrinkle if the base is formed straight in molding which comprises:

(a) providing mating injection molds with cavities having roughened surfaces defining the shape of the vane to be molded except that there is a reverse curve in the cavities for the base with a radius towards the point of the V and with a single gate into the cavity at one end of the base;

(b) injection molding the polymer into the mated mold cavities through the gate at elevated temperatures such that the plastic is molded at a pressure of less than about 10,000 pounds per square inch, wherein the mold is at an elevated temperature less than a temperature at which the polymer is thermoplastic and wherein the vane is held in the mold until the plastic solidifies;

(c) ejecting the vane from the mold and trimming the polymer at the gate wherein the reverse curve in the base decreases after the vane cools; and

(d) curing the vane on a flat surface at room temperature for a period of time sufficient to prevent permanent deformation during storage, thereby forming a vane wherein the fletch does not wrinkle when the vane is attached to an arrow shaft due to the molded reverse curve in the base.

8. The method of forming by molding an arrow vane with a base which attaches to the arrow and with a solid fletch defined by a curved outer edge projecting from the base, the fletch having a cross-section which tapers away from the base to the edge of the fletch such that the fletch can wrinkle if the base is formed straight in molding which comprises:

(a) providing mating injection molds with cavities having roughened surfaces defining the shape of the vanes to be molded except that there is a reverse curve towards the fletch in the cavities for the vane base;

(b) injection molding an elastomeric polyurethane polymer at less than 10,000 psi to form the vane;

(c) ejecting the vane from the mold and trimming excess polymer wherein the reverse curve in the base decreases after the vane cools; and

(d) curing the vane on a flat surface thereby forming a vane whch will not wrinkle when attached to an arrow shaft due to the molded reverse curve in the base.

4,136,145
MEDICAMENT CARRIERS IN THE FORM OF FILM HAVING ACTIVE SUBSTANCE INCORPORATED THEREIN

Peter Fuchs, and Jurgen Hilmann, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Germany

Division of Ser. No. 591,634, Jun. 30, 1975. This application Jul. 20, 1976, Ser. No. 707,032

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1974, 2432925; Oct. 17, 1974, 2449865

Int. Cl.[2] B29C *17/02*

U.S. Cl. 264—164 **12 Claims**

1. A process for the preparation of a pharmaceutical composition in unit dosage form adapted for enteral or topical administration and comprising a safe and effective amount of a pharmaceutically active medicament compound uniformly dispersed throughout a flexible, water-soluble film carrier therefor, which comprises the steps of:

(a) drawing into a sheet having a uniform layer thickness of about 0.1–2 mm and a dry thickness of about 0.05–1 mm., a homogeneous solution or suspension consisting essentially of (1) up to 60% by weight, based on the film carrier, of the medicament, (2) 0–30% by weight of a pharmaceutically acceptable filler, (3) a film-forming amount of a water-soluble film-forming polymer, and (4) as solvent or suspending medium, one or both of water and an organic volatile solvent system comprising an organic polar solvent miscible in water; and

(b) drying the thus-formed sheet to remove the solvent or suspending medium therefrom.

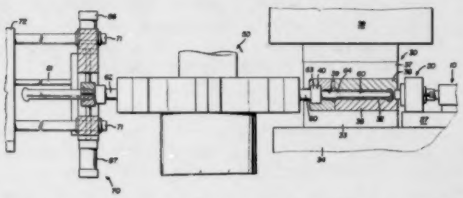
4,136,146
METHOD FOR FORMING TUBULAR PLASTIC ARTICLES

Lawrence D. Ninneman, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 3, 1976, Ser. No. 738,508

Int. Cl.[2] B29C *7/00;* **B29D** *23/02*

U.S. Cl. 264—237 **5 Claims**



1. A method of forming an essentially tubular, blowable, plastic parison, by the steps of:

(1) surrounding an essentially cylindrical mold surface with respective closed mold halves at a molding station to form an essentially tubular injection molding cavity;

(2) injection molding an essentially tubular parison around said cylindrical mold surface;

(3) cooling the parison while said parison is only interiorally supported by the mold surface and while displacing the mold surface along an arcuate path to a position at a stripping station in axial alignment with an axially reciprocable stripping mechanism including a pair of radially spaced gripping surfaces which are closable upon an exterior portion of the parison;

(4) axially displacing said pair of spaced gripping surfaces in unison from a position laterally spaced from the parison to a position in lateral alignment with said parison but radially separated therefrom;

(5) radially inwardly displacing said gripping surfaces in unison to engage and grip an external surface portion of the parison; and then

(6) axially displacing said gripping surfaces in unison with the parison held therebetween to strip the parison from the cylindrical mold surface;

(7) supporting said parison in a cantilevered manner between said gripping surfaces for further cooling; and then

(8) ejecting said parison by radially outwardly displacing the gripping surfaces in unison.

4,136,147
METHOD OF APPLYING FIRE-PROOFING MATERIAL TO ELONGATE STRUCTURAL MEMBER

John P. Wheeler, St. Louis, Mo., assignor to Carboline Company, St. Louis, Mo.

Filed Apr. 28, 1977, Ser. No. 791,729

Int. Cl.[2] B32B *31/06*

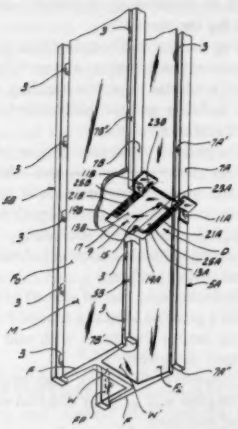
U.S. Cl. 264—261 **3 Claims**

1. The method of applying a coating of a spreadable, cementitious fire-proofing material to an elongate structural member of uniform cross section throughout its length having a web and a pair of flanges perpendicular to the web extending parallel to one another from one face of the web and facing one another, with the coating spread in a layer of generally uniform thickness on said one face of the web, in a layer of generally uniform thickness on the inside face of at least one of the flanges adjacent said one face of the web, and on the edge of

said one flange adjacent its said inside face, said method comprising the steps of:

securing a plurality of preformed spacers to the said edges of said flanges, said spacers being of a material compatible with said fire-proofing material, and being secured in a row at spaced intervals along each of said edges, said spacers being of generally equal thickness corresponding to a desired thickness for the layer of material on the said edge;

removably securing a pair of guide bars in position overlying the spacers on the said edges of each of the flanges, with each of said bars extending along a said row of spacers and spaced thereby from the edge of the respective flange a distance corresponding to the said desired thickness for the layer on the said edge, the surface of each bar facing generally outwardly away from the respective flange edge and generally parallel to the said one web face constituting a first guide surface for a spreading tool to establish in conjunction with the tool the thickness of the layer to be spread on the said one face of said web, and the opposed facing surfaces of said bars generally parallel to the inner flange faces constituting second guide surfaces for the tool, at least one of said second guide surfaces being spaced from the inside face of its respective flange a distance required to establish in conjunction with the tool the thickness of the layer to be spread on the inside face of said one flange;



applying said spreadable fire-proofing material to said one face of the web and the inside face of said one flange in a quantity in excess of that needed to provide the desired thickness for the said layers thereon;

running said tool along the bars, said tool having guide means engageable with said first guide surfaces of said bars and a screed which extends in between the bars and the flanges and has parallel side edges movable along the said second guide surfaces of the bars and an inner edge perpendicular to the side edges and spaced from said one face of the web, so that the inner edge of the screed strikes off the material on the said one face of the web to form the layer of generally uniform thickness on the web, so that one said side edge of the screed strikes off the material on the inside face of said one flange to form the layer of generally uniform thickness on said inside face, and so that excess material is forced to flow into the spaces between the edge of the said one flange and the guide bar thereon and between the spacers on said one flange to at least partially flow around the spacers to fill said spaces; and

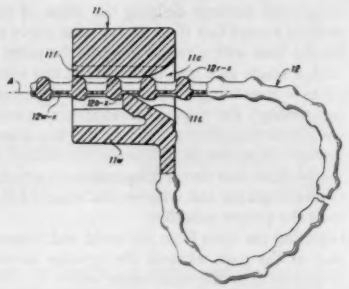
removing said guide bars after running said tool.

4,136,148

WEBBED HARNESSING DEVICE

Arthur W. Joyce, Framingham, Mass., assignor to Dennison Manufacturing Co., Framingham, Mass.

Filed Oct. 21, 1976, Ser. No. 734,572
Int. Cl.[2] F16L *33/00*
U.S. Cl. 264—291 **2 Claims**



1. The method of fabricating a harnessing device which comprises:

injecting a thermoplastic material into a mold for producing a head portion having an elongated guide channel extending therethrough, and a ladder structure with rungs that cross couple side rails and are engageable by a locking tang within said head portion, said head portion being attached to one end of said ladder structure;

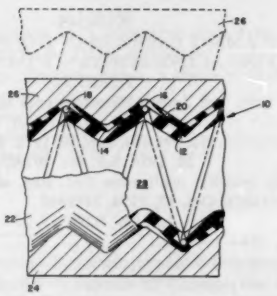
providing webbing between adjoining rungs and thinner than said rungs to achieve an improved filling characteristic for said mold and avoid regions of possible failure.

4,136,149

MOLDED RUBBER ARTICLE AND METHOD

Roger A. Payne, Parker, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 685,200, May 10, 1976. This application Jul. 18, 1977, Ser. No. 816,568
Int. Cl.[2] B29C *17/06*
U.S. Cl. 264—300 **4 Claims**



1. A method for releasing an externally molded rubber article from its associated metal mold surface, the outer surface of the article being comprised of a heat setting rubbery polymer normally adherent to the mold surface upon its release, without requiring use of a separate external mold release agent, comprising:

blending and incorporating with said heat setting rubbery polymer, prior to molding, from about 2 to about 175 weight percent of a chlorinated or brominated polyethylene based on the weight of the rubbery polymer to form a rubbery blend;

positioning the outer surface of the article, having said blend, against the mold surface and curing the article; and removing the thus formed molded article from the mold.

4,136,150

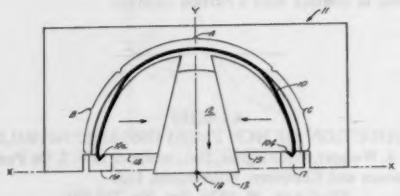
METHOD FOR MOLDING A CURVED FLEXIBLE PRINTING PLATE

John C. Darnall, Jr., Thousand Oaks, Calif., assignor to The Times Mirror Company, Los Angeles, Calif.

Division of Ser. No. 499,662, Aug. 22, 1974, Pat. No. 3,986,698. This application Jan. 27, 1976, Ser. No. 652,836

Int. Cl.² B29C *7/00*

U.S. Cl. 264—318 **12 Claims**



1. A method for releasing a flexible printing plate from the inner surface of a curved matrix after formation of the printing plate in a mold, the method comprising in the order recited the steps of:

moving the ends of the plate inwardly toward each other and away from the matrix only along a first axis to separate the ends of the plate from the matrix and to flex the center of the plate into stationary contact with the matrix; and

without any intervening movement of the ends of the plate following the movement thereof along the first axis, moving the ends of the plate away from the matrix only along a second axis perpendicular to the first axis to separate the center of the plate from the matrix.

2. A method for releasing a curved flexible printing plate from a mold having an outer mold half into which a curved matrix clamps and an inner mold half in which the plate is formed against the inner surface of the matrix, the inner mold half having a wedge-shaped center section converging toward the outer mold half, adjoining end sections, and means for clamping the ends of the plate to the end sections of the inner mold half, the method comprising the steps of:

withdrawing the center section from the outer mold half;

during the initial portion of the withdrawal of the center section, drawing the end sections together in a direction perpendicular to the withdrawal of the center section, while restraining movement of the end sections parallel to the withdrawal;

during the final portion of the withdrawal of the center section, restraining relative movement between the end sections and the center section to withdraw the end sections with the center section as a unit; and

releasing the clamping means after withdrawal of the end sections with the center section as a unit.

10. A method of molding a convexly curved flexible printing plate in a curved mold cavity having a concave matrix surface, the matrix surface being slightly less than one-half of a right cylinder, the method comprising the following steps:

injecting a molten plastic material into the mold cavity to fill the space therein;

cooling the injected plastic material to a solid while in the mold cavity; and

after cooling the plate effecting a two stage separation thereof by moving the ends of the plate away from the matrix surface

first together and inwardly only along a first axis to separate approximately the end quarters of the plate from the matrix surface while flexing approximately the center half of the plate into stationary contact with the matrix surface, and

second, without any intervening movement of the ends of the plate following the movement thereof along the first axis, only along a second axis perpendicular to the first axis to separate approximately the center half of the plate from the matrix.

4,136,151

PHOSPHORIC ACID PRODUCTION

Thomas N. Beaumont; Norman Robinson, both of Felixstowe, and Geoffrey N. Quinton, Kirton near Ipswich, all of England, assignors to Fisons Limited, London, England

Continuation of Ser. No. 592,316, Jul. 1, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,954

Claims priority, application United Kingdom, Jul. 6, 1974, 30042/74; Aug. 8, 1974, 34963/74; Sep. 25, 1974, 41668/74; Feb. 15, 1975, 6493/75

Int. Cl.² C01F *11/46*; C01B *25/16*

U.S. Cl. 423—166 **16 Claims**

1. In a process for the production of phosphoric acid by the treatment of phosphatic material with an acid, precipitating calcium sulphate and separating off the calcium sulphate as calcium sulphate dihydrate, the improvement which comprises improving the filtration and washing of the calcium sulphate dihydrate cyrstals by supplementing the overall amount of Al_2O_3 and SiO_2 provided by the phosphatic material so that the overall weight ratios of total Al_2O_3:P_2O_5 and total reactive SiO_2:total F fed to the reaction system prior to the initial precipitation of the calcium sulphate dihydrate have values within the range of 1:75 to 1:10 and up to 1:1, respectively.

12. In a process for the production of phosphoric acid by the treatment of a phosphatic material with an acid, precipitating calcium sulphate and, separating off the calcium sulphate as calcium sulphate dihydrate, the improvement which comprises adding sources of reactive SiO_2 and aluminum to the phosphatic material, prior to its use in the process of producing phosphoric acid, so that the phosphatic material has the weight ratios of total Al_2O_3:total P_2O_5 and total reactive SiO_2:total F within the ranges of 1:75 to 1:10 and up to 1:1, respectively.

4,136,152

METHOD FOR TREATING AQUEOUS MEDIUMS

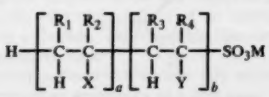
Robert L. Jones, Newtown; Lewis Volgenau, Ivyland, and Philip S. Davis, Furlong, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 30, 1976, Ser. No. 718,718

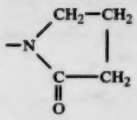
Int. Cl.² C01B *17/00*; B01D *5/00*; C02B *1/20*

U.S. Cl. 423—242 **29 Claims**

1. A method for dispersing magnesium sulfite tri-hydrate contained in an aqueous medium under precipitating conditions wherein said aqueous medium is the scrubber medium for a magnesium oxide based gas scrubber system, comprising adding in combination to the medium an effective amount for the purpose as a dispersant of: (i) an oligomer having the formula



where R_1, R_2, R_3 and R_4 are the same or different and are selected from the group consisting of hydrogen, methyl and ethyl, Y is at least one hydrophilic group selected from the group consisting of —COOH, —COOM, —$CONH_2$, —OCH_3, —OC_2H_5, —CH_2OH_7, and



X is one or more hydrophobic groups selected from the group consisting of $-COOC_2H_4OH$, $-COOC_3H_6OH$, $-CONHCH_2OH$, $-CONHCH_3$, $-CONHC_2H_5$, $-CONHC_3H_7$, $-CONHC_8H_{17}$, $-COOCH_3$, $-COOC_2H_5$, $-CN$, $-OOCCH_3$, $-OOCC_2H_5$, and $-CONHC(CH_3)_2-CH_2COOH$, a + b is 4 to 250, a/a+b is greater than zero, but not greater than 0.6, and M is a water soluble cation of a bisulfite salt; and

(ii) a sulfur-containing lignin.

4,136,153

SYSTEM FOR DIMINISHING THE EMISSION OF NOXIOUS GASES

Terrence M. Robertson, and Larry G. Smith, both of Baton Rouge, La., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 21, 1975, Ser. No. 551,876

Int. Cl.[2] C01B *17/00*

U.S. Cl. 423—242 **3 Claims**

1. In a process for removing SO_3 gas from exhaust gases from a sulfuric acid plant wherein said exhaust gases from said plant are treated in either absorbers or scrubbers or both and then conveyed to a mist eliminator system to remove sulfuric acid mist by injecting said exhaust gases into a tank, passing the exhaust gases through mist eliminator units and then conveying the exhaust gases out of the tank, the improvement comprising, when the mist eliminator system is in an overload condition, spraying liquid sulfuric acid onto the outer surface of the mist eliminator units to saturate the same so that the SO_3 gas will be absorbed when coming in contact with said mist eliminator units.

4,136,154

STABILIZED RED PHOSPHORUS AND PROCESS FOR MAKING IT

Horst Staendeke; Franz-Josef Dany; Joachim Kandler, and Werner Klose, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

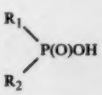
Filed Oct. 13, 1977, Ser. No. 841,833

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1976, 2647093

Int. Cl.[2] C01B *5/22*

U.S. Cl. 423—265 **16 Claims**

1. Stabilized pulverulent red phosphorus comprising a homogeneous blend of red phosphorus particles with a particle size of at most about 2 mm and a metal compound as an oxidation stabilizer, wherein the metal compound is the aluminum, calcium or zinc salt of a phosphinic acid of the general formula



in which R_1 and R_2 each stand for an alkyl, cycloalkyl, aryl or aralkyl group having 1 to 20 carbon atoms, the metal compound being present in the homogeneous blend in a proportion of about 0.5 to 5 weight %, wherein the phosphinic acid salt is formed by precipitating a phosphinic acid in the presence of the red phosphorus.

4,136,155

PRODUCTION OF PHOSPHINE

Klaus Hestermann, Erftstadt Bliesheim, and Gero Heymer, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 904,026

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721374

Int. Cl.[2] C01B *25/00*

U.S. Cl. 423—299 **9 Claims**

1. A process for making phosphine (hydrogen phosphide) by reacting phosphorus with water at elevated temperature, which comprises reacting gaseous yellow phosphorus with steam at temperatures of 280 to 400° C. in the presence of ammonia in contact with a carbon catalyst.

4,136,156

PRODUCTION OF HCN FROM ORGANIC NITRILES

Frank J. Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 30, 1976, Ser. No. 718,681

Int. Cl.[2] C01C *3/02*

U.S. Cl. 423—372 **9 Claims**

1. A process for preparing hydrogen cyanide comprising reacting hydrogen in the absense of air or oxygen with an organic nitrile of the formula

RCN or NCR^1CN

wherein

R is alkyl of 1–5 carbons wherein the alpha carbon bears a hydrogen atom and the beta carbon bears no hydrogen atom; alkenyl of 2–3 carbons substituted with one phenyl radical; phenyl substituted with up to three alkyl radicals of 1–2 carbons each; benzyl substituted with up to three alkyl radicals of 1–2 carbons each; or pyridyl;

R^1 is a single bond; methylene; phenylene substituted with up to two alkyl radicals of 1–2 carbons each; at a temperature of 400°–700° C. in the presence of a catalyst effective to produce hydrogen cyanide selected from the group consisting of

(A) a supported metal of the group Ir, Rh, Ru, Pd and Pt and

(B) an oxide of a metal of the group Al, Cr, Mg, Mn and Zn, and recovering hydrogen cyanide.

4,136,157

METHOD OF PREPARING PURIFIED SILVER NITRATE

Tomiyasu Asai, and Akira Endo, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 11, 1977, Ser. No. 814,580

Claims priority, application Japan, Jul. 9, 1976, 51-82324

Int. Cl.[2] C01B *21/48;* C01G *5/00*

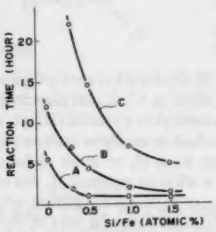
U.S. Cl. 423—395 **18 Claims**

1. In a method of manufacturing silver nitrate by dissolving metallic silver in nitric acid and removing metal impurities therefrom, the improvement which comprises adding Al^{+3} ion to a crude silver nitrate solution prepared by dissolving silver metal in nitric acid such that the amount of Al^{+3} added ranges from about 50 to about 1000 ppm based on the weight of the silver nitrate present and, silver oxide to adjust the pH of the solution to about 5.5 to about 6.5, whereby a precipitate of said impurities is formed, and then removing the precipitate formed from the silver nitrate solution.

4,136,158
PRODUCTION OF ACICULAR MAGNETIC IRON OXIDES

Yosiro Okuda; Nanao Horiishi; Hiroshi Sumita, and Tosiharu Harada, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Nov. 1, 1977, Ser. No. 847,446
Claims priority, application Japan, Nov. 1, 1976, 51-131849; Nov. 4, 1976, 51-133636; Dec. 15, 1976, 51-151385; Dec. 18, 1976, 51-152677
Int. Cl.[2] C01G *49/02*
U.S. Cl. 423—632 17 Claims



1. In the production of acicular ferromagnetic iron oxide of highly uniform particle size by oxidizing an iron (II) hydroxide suspension at a pH of at least 11 with an oxygen-containing gas to form acicular iron (III) oxide hydroxide, and reducing said acicular iron (III) oxide hydroxide into ferromagnetic iron oxide, the improvement which comprises:

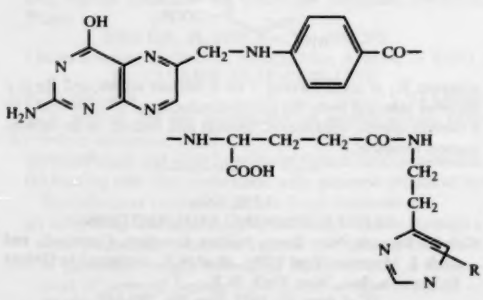
prior to the oxidation of said suspension with said oxygen-containing gas, providing said iron (II) hydroxide suspension with a water-soluble silicate in an amount of 0.1–1.7 atomic % based on the amount of the iron (II) hydroxide in the suspension and calculated as the ratio of Si to Fe (II).

4,136,159
RADIOASSAY OF FOLATES

Marcia J. Stone, Wellesley, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Feb. 28, 1977, Ser. No. 772,841
Int. Cl.[2] G01N *33/16*; A61K *43/00*
U.S. Cl. 424—1 32 Claims

10. A method for analyzing a sample for the presence of a folic acid compound selected from the group of folic acid, a metabolite of folic acid, a derivative of folic acid, or mixtures thereof, comprising mixing said sample with a preselected amount of a labeled compound of the chemical formula:



wherein R is ^{125}I or ^{131}I in the presence of a folate binder to bind at least some of said labeled compound, separating the bound labeled compound from the remaining free labeled compound, and counting the radiation emitted from either the bound labeled compound or the free labeled compound in a gamma counter.

4,136,160
SPECIFIC ASSAY FOR ACTIVE DEMYELINIZATION

Steven R. Cohen, 6923 Fieldcrest Rd., Baltimore, Md. 21215

Filed Aug. 17, 1977, Ser. No. 825,238
Int. Cl.[2] G01N *33/16*; A61K *43/00*
U.S. Cl. 424—1 9 Claims

1. A method of conducting a specific assay for active demyelinization comprising the steps of incubating human spinal fluid with a radioactive antisera to myelin basic protein, addition of a known quantity of radioactive myelin basic protein to the inculation mixture, a separation of the bound and free basic protein, and measurement of the radioactivity of the bound and unbound fractions.

4,136,161
STABILIZED ERYTHROCYTES AND METHODS THEREFOR

Frank J. Falkowski, Lebanon, and Leonard T. Wilson, Somerville, both of N.J., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Mar. 16, 1976, Ser. No. 667,316
Int. Cl.[2] A61K *35/18, 39/00*; G01N *33/16*
U.S. Cl. 424—3 11 Claims

1. The method for stabilizing erythrocytes which comprises contacting erythrocytes in biologically suitable aqueous medium in a first treatment step with from 0.1 to 0.4 gms. of glyoxal per 0.8 ml. of Packed Cell Volume of said erythrocytes to obtain treated erythrocytes, and thereafter contacting said treated erythrocytes in biologically suitable aqueous medium in a second treatment step with at least 0.1 gms. of formaldehyde or glyoxal per 0.8 ml. of Packed Cell Volume of said treated erythrocytes, said aqueous medium being hypertonic and having a degree of tonicity substantially compatible with the integrity of the erythrocytes.

10. Indicator erythrocytes useful in antigen-antibody detection which comprises erythrocytes chemically reacted in an aqueous medium with from 0.1 to 0.4 grams of glyoxal per 0.8 ml. of packed volume of said erythrocytes and then in an aqueous medium with at least 0.1 grams of formaldehyde per 0.8 ml. of Packed Cell Volume of glyoxal reacted erythrocytes, said aqueous medium being substantially compatible with the integrity of the erythrocytes.

4,136,162
MEDICAMENT CARRIERS IN THE FORM OF FILM HAVING ACTIVE SUBSTANCE INCORPORATED THEREIN

Peter Fuchs, and Jürgen Hilmann, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Germany

Continuation of Ser. No. 803,328, Jun. 3, 1977, abandoned, which is a continuation of Ser. No. 591,634, Jun. 30, 1975, abandoned. This application Dec. 27, 1977, Ser. No. 865,080
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1974, 2432925; Oct. 17, 1974, 2449865
Int. Cl.[2] A61K *9/70, 31/70, 31/74*
U.S. Cl. 424—27 16 Claims

1. In a pharmaceutical composition in unit dosage form for enteral or topical administration and comprising a safe and a pharmaceutically effective amount of an active medicament compound and a flexible, water soluble film carrier therefor, the improvement wherein:

the medicament is dissolved or uniformly suspended in a film carrier consisting essentially of a non-ionic, water soluble methyl ether or hydroxyalkyl ether of cellulose and the pharmaceutical composition is in the form of a tissue-like sheet, having a uniform dry film thickness of about 0.05–1 mm., drawn from a solution of the film carrier containing 0–30% by weight of a filler and up to 60% by weight of the film carrier of the medicament.

4,136,163
P-MENTHANE CARBOXAMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and David J. Spring, Datchet, all of England, assignors to Wilkinson Sword Limited, London, United Kingdom

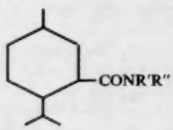
Continuation-in-part of Ser. No. 221,755, Jan. 28, 1972, abandoned. This application Jul. 8, 1974, Ser. No. 486,564

Claims priority, application United Kingdom, Feb. 4, 1971, 3928/71; Feb. 4, 1971, 3934/71

Int. Cl.[2] A61K *7/22*

U.S. Cl. 424—54 **12 Claims**

1. In a consumer product for application to or consumption by the human body comprising a consumer product base and, as adjuvants in said base, (i) at least one of the following: a flavourant, colourant, perfuming agent, surface active ingredient, antiseptic or pharmaceutically active agent, and (ii) an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body in those parts of the human body with which the product comes in contact during use, the improvement which comprises using as the cold receptor stimulating ingredient an effective amount of a substantially odourless cold receptor stimulating compound of the formula:



wherein R' is hydrogen or an alkyl, cycloalkyl, alkenyl, cycloalkenyl, hydroxyalkyl, alkynyl, acyloxyalkyl, alkoxyalkyl, aminoalkyl, acylaminoalkyl, carboxyalkyl radical or an alkylcarboxyalkyl radical of the formula — $C_nH_{2n}COOR'''$, wherein — C_nH_{2n} is a straight or branched chain alkylene group in which n is an integer from 1 to 6 and R''' is C_1–C_8 alkyl, each of said radicals containing up to 25 carbon atoms; and R'' is hydroxyl or an alkyl, cycloalkyl, alkenyl, cycloalkenyl, hydroxyalkyl, alkynyl, acyloxyalkyl, alkoxyalkyl, aminoalkyl, acylaminoalkyl, carboxyalkyl radical or an alkylcarboxyalkyl radical of the formula — $C_nH_{2n}COOR'''$, wherein — C_nH_{2n} is a straight or branched chain alkylene group in which n is an integer from 1 to 6 and R''' is C_1–C_8 alkyl, each of said radicals containing up to 25 carbon atoms; with the proviso that when R' is hydrogen R'' may also be an aryl radical of up to 10 carbon atoms selected from benzyl and substituted phenyl wherein the substituents are selected from C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, nitro and halogen.

4,136,164
CERTAIN SUBSTITUTED AMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT

David G. Rowsell, Staines, and Roger Hems, Maidenhead, both of England, assignors to Wilkinson Sword Limited, London, England

Division of Ser. No. 568,663, Apr. 16, 1975, Pat. No. 4,044,120. This application Jun. 2, 1977, Ser. No. 802,371

Claims priority, application United Kingdom, Apr. 17, 1974, 16803/74

Int. Cl.[2] A61K *7/22*

U.S. Cl. 424—54 **11 Claims**

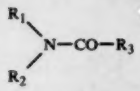
1. In a manufactured consumer product for application to or consumption by the human body and being:

(a) a personal care product comprising a topically or orally administrable base medium containing a flavourant, clourant, perfume, surface active agent or antiseptic agent;

(b) an ingestible preparation comprising an edible or potable base containing a flavourant or colourant;

(c) a pharmaceutical preparation comprising a topically or orally administrable pharmaceutically acceptable carrier and an active pharmaceutical ingredient; or

(d) a tobacco containing consumer product, said consumer product also containing an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body when brought into contact therewith by application or consumption of the said product, the improvement which comprises using as said cold receptor stimulating ingredient an effective amount of an amide of the formula:



wherein R_1 is H, C_1-C_7 alkyl or C_3-C_6 cycloalkyl;

R_2 is C_3-C_8 alkyl or C_3-C_8 alkylcycloalkyl, alkylcycloalkylalkyl, cycloalkyl or cycloalkylalkyl, with the proviso that R_2 is branched at an alpha carbon atom relative to the N atom when R_1 is H, or at an alpha or beta carbon atom when R_1 is alkyl or cycloalkyl, this condition being satisfied in the case of cyclic groups when the carbon atom attached to the N atom is part of the cycle;

R_1 and R_2 together provide a total of at least 5 carbon atoms;

R_3 is H, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_2-C_8 hydroxyalkyl, C_2-C_8 carboxyalkyl or C_3-C_8 alkylcarboxyalkyl, with the proviso that when R_3 is C_6 alkyl it is primary in structure; and

R_1, R_2 and the group —COR_3 together provide a total of from 7–16 carbon atoms.

4,136,165
COSMETIC PREPARATIONS WITH ALKOXYBENZOIC ACID ESTERS AS INFLAMMATION INHIBITORS AND METHOD

Hinrich Möller, Dusseldorf, and Hans-Joachim Thimm, Hilden, both of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

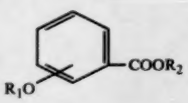
Filed Apr. 22, 1977, Ser. No. 789,844

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 26178176

Int. Cl.[2] A61K *7/44, 31/235;* A61L *23/00*

U.S. Cl. 424—60 **3 Claims**

1. A process for the care of the skin of warm-blooded animals against topical inflammation from sunburn comprising topically applying to the skin a safe but effective amount for the inhibiting of inflammation from sunburn of an alkoxybenzoic acid ester of the formula



wherein R_1 is alkyl having 1 to 6 carbon atoms and R_2 is a member selected from the group consisting of alkyl having 1 to 8 carbon atoms, cyclohexyl, phenyl and benzyl, as an inflammation inhibitor.

4,136,166
SKIN LIGHTENING COMPOSITION

Gabriel Barnett, New York; Nathan Gershaw, Commack, and Jack J. Mausner, East Hills, all of N.Y., assignors to Helena Rubinstein, Inc., New York, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,440

Int. Cl.[2] A61K *7/135*

U.S. Cl. 424—62 **3 Claims**

1. A skin lightening cosmetic composition, comprising, in parts by weight:

A)	cetyl alcohol	0.25 – 8.00
	polyoxyethylene(40)stearate	0.25 – 5.00
	polyoxyethylene(2)cetyl ether	0.25 – 5.00
	white mineral oil	2.00 – 35.00
	preservative	effective amount
	stearic acid	0.25 – 5.00
	amyl p-dimethylaminobenzoate	0.25 – 5.00
B)	propylene glycol	1.00 – 15.00
	preservative	effective amount
	hydroxyethylcellulose	0.25 – 3.50
	magnesium aluminum silicate	0.25 – 3.50
	ethylenediaminetetraacetic acid disodium salt	0.05 – 1.00
	citric acid (20% aq. sol'n)	0.10 – 1.00
	hydroquinone	0.10 – 4.00
	water	qs. 100
C)	sodium sulfite	0.05 – 2.50
	sodium metabisulfite	0.05 – 2.50
	water	qs. 100.

4,136,167

PROCESS FOR REDUCING THE INCIDENCE OF NEONATAL DIARRHOEA IN PIGS

Stephen H. Parry, Manton Heights, and Philip Porter, Arun Close, both of England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Continuation of Ser. No. 694,613, Jun. 10, 1976, abandoned. This application May 6, 1977, Ser. No. 794,384

Claims priority, application United Kingdom, Jun. 12, 1975, 25221/75

Int. Cl.[2] A61K *39/02, 39/40*

U.S. Cl. 424—87 **1 Claim**

1. A process for reducing the incidence of neonatal diarrhoea in pigs, in which process a vaccine consisting essentially of K88a,b/adhesion factor of a swine enteropathogenic strain of *E. coli* adsorbed from a cell-free aqueous solution by substantially saturating chicken erythrocytes possessing their natural unmodified surface agglutination characteristics of forming complexes with proteins is parenterally administered to a pregnant sow about 3 weeks before farrowing so that at parturition the colostrum of said sow contains an effective concentration of antibodies to said K88a,b/adhesion factor.

4,136,168

PROCESS FOR THE PREPARATION OF NEURAMINIDASE FROM VIRAL SOURCES AND METHODS OF UTILIZING SAME

Robert Fontanges, Lyon, France, assignor to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

Filed Feb. 26, 1975, Ser. No. 553,293

Claims priority, application France, Mar. 5, 1974, 74 07352

Int. Cl.[2] A61K *39/18*; C12D *13/00*

U.S. Cl. 424—89 **12 Claims**

1. A process for the preparation of neuraminidase from myxovirus influenzae which comprises the steps of:

(a) suspending said virus in saline to form a viral suspension;

(b) treating said viral suspension with protease produced by Streptomyces fradiae to form a lysed suspension;

(c) subjecting said lysed suspension to diafiltration through a semi-permeable membrane capable of retaining molecules of molecular weight exceeding 10,000 to form a concentrate of material having a molecular weight in excess of 10,000;

(d) subjecting said concentrate to discontinuous density gradient centrifugation; in aqueous sodium glutamate;

(e) isolating the centrifugate fractions containing neuraminidase.

4,136,169

CROSS-PROTECTIVE FOWL CHOLERA BACTERINS

Paul A. Rebers, Nevada, Iowa, and Kenneth L. Heddleston, Lakeview, Ark., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 24, 1978, Ser. No. 880,832

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 **7 Claims**

1. A method for preparing modified bacterins useful in the cross-protective vaccination of fowl against strains of both the same and different immunologic and serologic types of *Pasteurella multocida* comprising the following steps:

a. providing fowl tissue infected with cells of a strain of said *Pasteurella multocida;*

b. inoculating a culture medium with said tissue infected with said *Pasteurella multocida* cells;

c. passaging said *Pasteurella multocida* cells on said inoculated culture medium; only once, without subsequent sub-culturing

d. killing said cells passaged on said inoculated medium to yield said modified bacterins; and

e. recovering said modified bacterins from step (d).

4,136,170

METHOD OF EXTRACTING A HYPERGLYCEMIC FACTOR

André Thomas, 8, Rue Pierre et Marie Curie, 75005 Paris, France

Filed Nov. 18, 1976, Ser. No. 742,908

Claims priority, application France, Nov. 21, 1975, 75 35645; Nov. 21, 1975, 75 35646; Nov. 10, 1976, 76 33847

Int. Cl.[2] A61K *35/28*

U.S. Cl. 424—95 **17 Claims**

1. A process for preparing a hyperglycemic factor, causing general glycosuric expulsion, characterized by extracting said factor from red bone marrow obtained from flat bones from which the hard bony walls have been removed by contact thereof with an aqueous medium at 60–100° C and at a buffered pH of between 4 and 7 or of approximately 7.5 for a time sufficient to extract said factor.

17. A hyperglycemic factor causing general glycogenolysis and glycosuric expulsion, comprising an extract of a red bone marrow obtained from flat bones and having the characteristics of being heat-stable, proteinic, exhibiting low or no fluorescence in ultraviolet light and sharply reacting with p. dimethylaminobenzaldehyde.

4,136,171

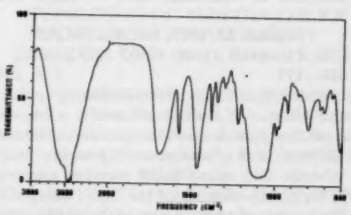
ANTIBIOTIC 354 AND PROCESS FOR PRODUCING SAME

Clarence De Boer, Kalamazoo; Lester A. Dolak, Plainwell, and Durey H. Peterson, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 19, 1977, Ser. No. 834,286

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—117 **9 Claims**



1. Antibiotic 354 which is active against Pseudomonas and

Proteus and which in its essentially pure form is characterized as the sulfate salt having the following characteristics:

a. molecular weight of 172 (field desorption mass. spec.);
b. has the following elemental analysis: C, 37.08; H, 4.79; N, 12.38; Cl, 15.52; S, 7.48; O, 22.75;
c. is soluble in water and relatively insoluble in methanol, acetone, dimethylsulfoxide and dimethylformamide;
d. has a characteristic infrared absorption spectrum when dissolved in a mineral oil mull as shown in FIG. 1 of the drawings;
e. has a characteristic ultraviolet absorption spectrum as shown in FIG. 2 of the drawings; and,
f. has a characteristic NMR spectrum as shown in FIG. 3 of the drawings.

4,136,172

FUNGICIDAL COMPOSITION AND METHOD OF USE

Erwin G. Walliczek, Beaumaris, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Feb. 24, 1976, Ser. No. 661,021
Claims priority, application Australia, Mar. 10, 1975, PC0850
Int. Cl.[2] A61K *33/34*
U.S. Cl. 424—141 **19 Claims**

1. A pharmaceutical composition for the treatment of topical fungal diseases in animals comprising a solution of cuprous copper ions in association with halide ions in a pharmaceutically acceptable polyether chosen from the group consisting of:

a liquid condensate of ethylene oxide, propylene oxide, butylene oxide or mixtures thereof;

a sequential or random cocondensate of ethylene oxide, propylene oxide, butylene oxide or mixtures thereof; or a condensate of aliphatic alcohol containing from 1 to 24 carbon atoms, an alkylphenol or a fatty acid with ethylene oxide or propylene oxide as such or cocondensed either sequentially or randomly with propylene oxide or butylene oxide;

a liquid alcohol alkoxylate prepared by condensation of ethylene oxide, propylene oxide, butylene oxide or mixtures thereof with an aliphatic alcohol containing 1 to 24 carbon atoms; and

a liquid phenol alkoxylate prepared by condensation of ethylene oxide, propylene oxide, butylene oxide or mixtures thereof with an alkyl phenol containing 4 to 20 carbon atoms, the proportion of copper in the solution being in the range of 0.01 to 12 percent by weight, said composition being prepared by the extraction with said polyether of an aqueous solution saturated with a halide salt of an alkali or alkaline earth metal and comprising a cuprous halide salt and optionally a mild reducing agent, or exposing a mixture comprising cupric chloride dihydrate and said polyether, in the absence of air or oxygen, to visible or ultraviolet light.

4,136,173

MIXED XANTHAN GUM AND LOCUST BEAM GUM THERAPEUTIC COMPOSITIONS

Matura K. Pramoda, and Song-Ling Lin, both of Rouses Point, N.Y., assignors to American Home Products Corp., New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,319
Int. Cl.[2] A61K *35/48, 47/00, 31/35, 31/12*
U.S. Cl. 424—177 **17 Claims**

1. A pharmaceutical composition consisting essentially of a pH sensitive solution of a pharmaceutically acceptable liquid vehicle of xanthan gum, locust bean gum and a therapeutically effective amount of a pharmaceutically active drug in said vehicle; wherein said mixed gums together comprise about 0.01–1.0% weight by volume of the liquid composition; and wherein the percent of xanthan gum in the mixed gums is from about 6–94% of the total gum content, the remainder being locust bean gum; said composition being a liquid at a pH of less than about 3.5–5 and a gel at a pH above about 5; and wherein said liquid vehicle comprises 60–100% water by volume.

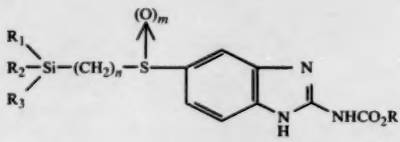
4,136,174

BENZIMIDAZOLECARBAMATES AND METHOD

Rudiger D. Haugwitz, Titusville, and Peter C. Wade, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 18, 1978, Ser. No. 870,391
Int. Cl.[2] A61K *31/695;* C07F *7/10*
U.S. Cl. 424—184 **14 Claims**

1. A compound of the structure



wherein R is lower alkyl containing 1 to 7 carbons, R_1, R_2 and R_3 may be the same or different and are selected from the group consisting of straight or branched chain lower alkyl containing 1 to 7 carbons or straight or branched chain lower alkoxy containing 1 to 7 carbons, provided that only one or two of R_1, R_2 and R_3 may contain more than one branch, m is 0, 1 or 2, and n is 1 to 5.

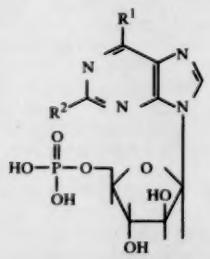
4,136,175

PURINE NUCLEOTIDE ANTIVIRAL COMPOSITION AND METHODS OF USE

Janet E. Rideout; Richard L. Miller, both of Raleigh, and Gertrude B. Elion, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 16, 1976, Ser. No. 696,519
Claims priority, application United Kingdom, Jun. 17, 1975, 25768/75
Int. Cl.[2] A61K *31/52;* C07C *19/20*
U.S. Cl. 424—180 **30 Claims**

6. A method of treating DNA viral infections in mammals, comprising the administration of an effective non-toxic DNA antiviral amount of a compound of formula (I)



or a pharmaceutically acceptable salt thereof.

4,136,176
O-ALKYL-O-[6-SUBSTITUTED-THIO-PYRIDAZIN-3-YL]-(THIONO) (THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Fritz Maurer; Reiner A. Fuchs, both of Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath-Steinenbrueck, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

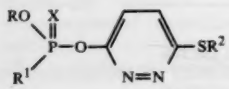
Filed May 25, 1977, Ser. No. 800,603

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2627075

Int. Cl.[2] C07D *9/65;* A01N *9/36*

U.S. Cl. 424—200 9 Claims

1. An O-alkyl-O-[6-substituted-thio-pyridazin-3-yl]-(thiono) (thiol)-phosphoric (phosphonic) acid ester of the formula



in which

R is alkyl,

R^1 is alkyl, alkylthio or alkylamino,

R^2 is alkyl, alkenyl, alkynyl phenyl or alkylthiophenyl, and

X is oxygen or sulphur.

9. A method of combating insect or acarid pests which comprises applying to the pests or a habitat thereof an insecticidally or acaricidally effective amount of

O-methyl-O-[6-methylthio-pyridazin-3-yl]-ethanethionophosphonic acid ester,

O-iso-propyl-O-[6-methylthiopyridazin-3-yl]-methanethionophosphonic acid ester,

O-ethyl-O-[6-methylthiopyridazin-3-yl]-ethanethionophosphonic acid ester,

O-methyl-O-[6-ethylthio-pyridazin-3-yl]-ethanethionophosphonic acid ester, or

O-ethyl-O-[6-phenylthio-pyridazin-3-yl]-ethanethionophosphonic acid ester.

4,136,177
XANTHAN GUM THERAPEUTIC COMPOSITIONS

Song-Ling Lin, and Maturu K. Pramoda, both of Rouses Point, N.Y., assignors to American Home Products Corp., New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,318

Int. Cl.[2] A61K *31/47, 31/66, 31/27, 31/415*

U.S. Cl. 424—211 12 Claims

1. A composition consisting essentially of a therapeutically effective amount of a topically effective ophthalmic drug and about 0.01% to about 2.5% of xanthan gum in a pharmaceutically acceptable liquid vehicle, said liquid vehicle comprising about 50–100% water by volume.

4,136,178
LOCUST BEAN GUM THERAPEUTIC COMPOSITIONS

Song-Ling Lin, and Maturu K. Pramoda, both of Rouses Point, N.Y., assignors to American Home Products Corp., New York, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,320

Int. Cl.[2] A61K *31/27, 31/47, 31/66, 31/415*

U.S. Cl. 424—211 12 Claims

1. A composition consisting essentially of a therapeutically effective amount of a topically effective ophthalmic drug and about 0.01% to about 2.5% of locust bean gum in a pharmaceutically acceptable liquid vehicle, said liquid vehicle comprising about 75–100% water by volume.

4,136,179
2,2-DIMETHYL-19-NOR-STEROIDS

Lucien Nedelec, Le Raincy; Vesperto Torelli, Maisons-Alfort, and Robert Fournex, Paris, all of France, assignors to Roussel Uclaf, Paris, France

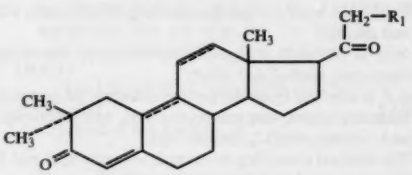
Filed Sep. 7, 1977, Ser. No. 831,254

Claims priority, application France, Sep. 17, 1976, 76 28026

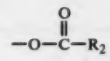
Int. Cl.[2] A61K *31/56;* C07J *17/00*

U.S. Cl. 424—242 17 Claims

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen, —OH and

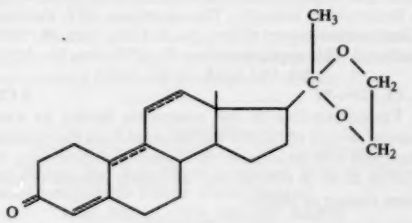


and R_2 is selected from the group consisting of hydrogen and hydrocarbon of 1 to 17 carbon atoms and the dotted lines indicate the optional presence of a double bond in 9(10) and 11(12) positions, with the proviso that when the C ring is unsaturated, the B ring is unsaturated.

10. An antialdosteronic composition comprising an antialdosteronically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

13. A method of treating arterial hypertension and cardiac insufficiency in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim 1 to relieve arterial hypertension and cardiac insufficiency.

16. A compound of the formula



wherein the dotted lines indicate the optional presence of a double bond.

4,136,180
HYPOLIPIDEMIC SUBSTITUTED STYRENESULFONYLUREAS

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

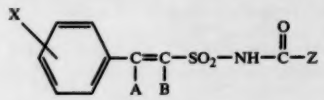
Division of Ser. No. 689,580, May 24, 1976, Pat. No. 4,062,960, which is a division of Ser. No. 521,445, Nov. 6, 1974, Pat. No. 3,983,107, which is a continuation-in-part of Ser. No. 422,088, Dec. 5, 1973, abandoned. This application Sep. 12, 1977, Ser. No. 832,063

Int. Cl.[2] A61K *31/395, 31/55;* C07D *223/00, 295/00*

U.S. Cl. 424—244 5 Claims

1. A method for lowering elevated blood lipid levels in a hyperlipidemic mammal, which comprises administering to

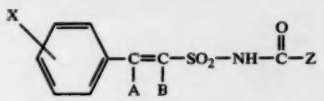
said mammal a blood lipid level lowering amount of a compound of the formula



or a pharmaceutically-acceptable salt thereof;
wherein
X is selected from the group consisting of hydrogen, chloro and methyl;
A and B are each selected from the group consisting of hydrogen, methyl and ethyl;
and Z is selected from the group consisting of morpholino, thiomorpholino, azacycloheptan-1-yl, azacyclooctan-1-yl and 3-azabicyclo[3.2.2]nonan-3-yl.

2. The method according to claim 1, wherein X, A and B are each hydrogen and Z is azacycloheptan-1-yl.

3. A compound of the formula



or a pharmaceutically-acceptable salt thereof;
wherein
X is selected from the group consisting of hydrogen, chloro and methyl;
A and B are each selected from the group consisting of hydrogen, methyl and ethyl;
and Z is selected from the group consisting of morpholino, thiomorpholino, azacycloheptan-1-yl, azacyclooctan-1-yl and 3-azabicyclo[3.2.2]nonan-3-yl.

4,136,181
VACCINES AGAINST OEDEMA DISEASE OF PIGLETS

Lucia Dobrescu, Brussels; Constant Huygelen, Huldenberg, and Frans Van Wijnendaele, Ottenburg, all of Belgium, assignors to Recherche et Industrie, Therapeutiques, RIT, Belgium

Continuation-in-part of Ser. No. 715,746, Aug. 18, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,451
Int. Cl.[2] A61K *39/00, 39/02*
U.S. Cl. 424—92 **5 Claims**

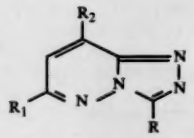
1. Enterotoxin-free *E. coli* neurotoxin having an average molecular weight of 100,000 and obtained from the supernatant of disrupted cells of a culture of a neurotoxin producing strain of a 0138, 0139 or 0141 *E. coli* serogroup capable of causing oedema disease of piglets.

4,136,182
TRIAZOLOPYRIDAZINES USED TO ALLEVIATE BRONCHIAL SPASMS

Jon Lewis, Indianapolis, and Philip J. Shea, Carmel, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 690,326, May 26, 1976, abandoned, which is a continuation of Ser. No. 569,417, Apr. 18, 1975, abandoned, which is a continuation of Ser. No. 399,566, Sep. 21, 1973, abandoned. This application Feb. 13, 1978, Ser. No. 877,061
Int. Cl.[2] A61K *27/00, 31/495*
U.S. Cl. 424—248.54 **7 Claims**

1. A method useful for alleviating bronchial spasm in mammals, the method comprising administering internally to a mammal in need thereof a bronchodilating amount of a triazolopyridazine or a pharmacologically-acceptable salt thereof, the triazolopyridazine corresponding to the formula:



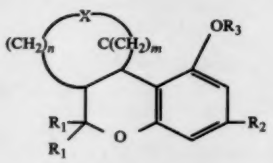
wherein R represents hydrogen, phenyl, loweralkyl or loweralkyl carbonylamido; R_1 represents morpholino or piperidino; and R_2 represents hydrogen or loweralkyl with the proviso that at least one of R and R_2 is a moiety other than hydrogen and with the further proviso that when R is phenyl, R_1 is morpholino and R_2 is loweralkyl.

4,136,183
BENZOPYRANOPYRIDINES AS ANTIGLAUCOMA AGENTS

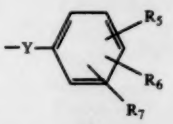
Anthony T. Dren, Waukegan, and Barbara A. Bopp, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 4, 1976, Ser. No. 711,749
Int. Cl.[2] A01N *9/00, 9/22, 9/28*
U.S. Cl. 424—248.56 **7 Claims**

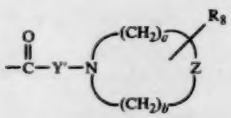
1. A method of reducing intra-ocular pressure in mammalian patients comprising administering to a glaucoma patient a therapeutically effective amount of a compound of the formula



wherein, in the C ring, X is NR_4 where R_4 is H, loweralkyl, loweralkenyl, loweralkynyl or lower alkanoyl; n is an integer of 0 to 3 and m is an integer of 0 to 3, each R_1 is loweralkyl and when taken together the substituents R_1R_1 form oxygen; R_2 is a C_1–C_{20} straight or branched chain alkyl, cycloalkyl, or



wherein Y is a straight or branched chain alkylene group having from 1 to 10 carbon atoms, and each R_5, R_6 and R_7 are the same or different members of the group consisting of H, halo and loweralkyl; R_3 is



wherein Y' is a straight or branched chain alkylene group having 1 to 8 carbon atoms, a is an integer from 1 to 4, b is an integer from 1 to 4, Z is CH_2, O, S or NR_9 where R_9 is H or loweralkyl, with the provision that when Z is O, S or NR_9, the sum of a and b is 3 or 4, and R_8 is H or lower-alkyl; or the pharmaceutically acceptable salts thereof.

4,136,184
HYDROXYALKYL SUBSTITUTED-4,5-DIHYDROPYRIDAZIN(2H)-3-ONES AND DIAZABICYCLO-ENE-ONES

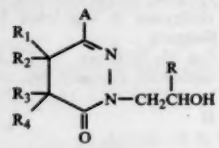
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 614,539, Sep. 18, 1975, Pat. No. 4,055,644, which is a division of Ser. No. 409,653, Oct. 25, 1973, Pat. No. 3,931,176, which is a continuation-in-part of Ser. No. 366,670, Jun. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,159, Sep. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 166,565, Jul. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 88,976, Nov. 12, 1970, abandoned. This application Jul. 22, 1977, Ser. No. 818,070

Int. Cl.[2] A61K *31/50*

U.S. Cl. 424—250 10 Claims

1. A pharmaceutical composition useful as a tranquilizer, anti-convulsant or muscle relaxant comprising a therapeutically effective amount of a compound of the formula



where R is lower alkyl having 1 to 4 carbon atoms,

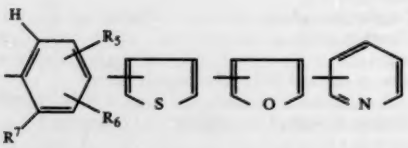
R_1, R_2, R_3 and R_4 each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms or

R_1 and R_4 represent hydrogen and

R_2 and R_3 together represent

where n is 2, 3, or 4 and

A represents



where R_7 represents hydrogen, fluoro, chloro or straight chain lower alkyl having 1 to 4 carbon atoms and

R_5 and R_6 each independently represent hydrogen, fluoro, chloro, trifluoromethyl or lower alkyl having 1 to 4 carbon atoms

provided that when both R_5 and R_6 represent trifluoromethyl, they are on other than adjacent carbon atoms and that at least one of R_5, R_6 and R_7 is hydrogen and a pharmaceutically acceptable carrier therefor.

4,136,185
N-ARYL-N'-(PHENYL-OR PHENOXY-ALKYL)-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Fed. Rep. of GermanyR, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

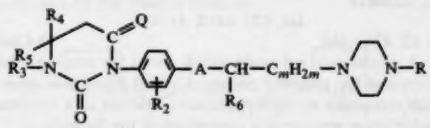
Continuation-in-part of Ser. No. 793,736, May 4, 1977, Pat. No. 4,100,282, which is a continuation-in-part of Ser. No. 636,734, Dec. 1, 1975, Pat. No. 4,038,279, which is a continuation-in-part of Ser. No. 427,367, Dec. 21, 1973, Pat. No. 3,941,789. This application Mar. 15, 1978, Ser. No. 886,634

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263211

Int. Cl.[2] A61K *31/505;* C07D *403/10*

U.S. Cl. 424—251 5 Claims

1. A compound of the formula



wherein

R is phenyl; phenyl having one or two substituents attached thereto, said substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, chlorine and trifluoromethyl; naphthyl; 1- or 2-tetrahydronaphthyl; 1- or 2-indanyl; pyridyl; or thiazolyl;

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms;

R_4 and R_5 are each hydrogen or alkyl of 1 to 4 carbon atoms;

Q is oxygen or two hydrogens;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms or halogen;

A is a single carbon-to-carbon bond or —OCH_2—;

R_6 is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms or alkanolyloxy of 1 to 4 carbon atoms, and

m is 0, 1, 2, 3, 4 or 5, but other than 0 when R_6 is hydroxyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective CNS-depressing amount of a compound of claim 1.

4,136,186
THIENO[3,2-c]PYRIDINE DERIVATIVES

Daniel Frehel, and Jean-Pierre Maffrand, both of Toulouse, France, assignors to Parcor, Paris, France

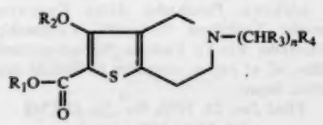
Filed Jan. 13, 1977, Ser. No. 763,876

Claims priority, application France, Jan. 22, 1976, 76 01637

Int. Cl.[2] C07D *513/04;* A61K *31/44*

U.S. Cl. 424—256 4 Claims

1. A thieno[3,2-c]pyridine derivative selected from a compound having the formula:



in which:

R_1 is alkyl having 1-6 carbon atoms;

R_2 is hydrogen;

R_3 is hydrogen;

R_4 is a radical selected from hydrogen, benzoyl, phenyl, and phenyl substituted with a halogen atom; and

n is an integer from 0 to 2; and a pharmaceutically acceptable acid addition salt thereof.

2. Therapeutic composition having an inhibiting activity on blood-platelet aggregation, comprising, as active ingredient, a therapeutically effective amount of a compound as claimed in claim 1, together with a therapeutically acceptable carrier.

4,136,187

ANTIHYPERTENSIVE 2-AMINO-4,5-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

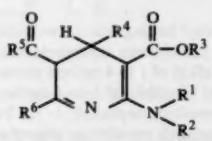
Division of Ser. No. 383,962, Jul. 30, 1973, Pat. No. 3,959,292. This application Oct. 29, 1974, Ser. No. 518,283

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1972, 2239815

Int. Cl.[2] A61K *31/455*

U.S. Cl. 424—266 **93 Claims**

1. A pharmaceutical composition useful for treating hypertension and for effecting coronary vessel dilation in animals which comprises an antihypertensive amount or a coronary-vessel-dilating amount of a compound of the formula:



or a physiologically-acceptable acid addition salt thereof, wherein

R^1 when taken independently is hydrogen or lower alkyl;

R^2 when taken independently is lower alkyl or benzyl; or

R^1 and R^2 together with the nitrogen atom to which they are attached form a cyclic amine wherein R^1 and R^2 together represent alkylene of 4 to 7 carbon atoms;

R^3 is lower alkyl, lower alkenyl or lower alkynyl;

R^4 is lower alkyl; lower alkenyl; lower alkynyl; phenyl; phenyl substituted by one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio and phenyl; or naphthyl;

R^5 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino; and

R^6 is hydrogen, lower alkyl or phenyl; in combination with a pharmaceutically acceptable, nontoxic diluent or carrier.

4,136,188

TREATMENT OF DIABETES WITH 2-SUBSTITUTED-1,3-DIAZACYCLIC COMPOUNDS

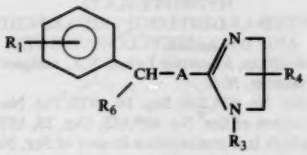
Fumiyoshi Ishikawa, Funabashi; Akira Kosasayama, Yotsukaidomachi; Yoshifumi Watanabe, Funabashi; Yasushi Abiko, Matsudo; Kin-Ya Kameda, Narashino, and Shin-etu Ono, Chiba, all of Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1976, Ser. No. 699,761

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 R **3 Claims**

1. A method of treating diabetes mellitus comprising administering a therapeutically effective amount for treating diabetes mellitus of at least one compound of the following structural formula or pharmaceutically acceptable salt thereof to a patient in need of such treatment:



wherein R_1 represents a hydrogen atom, a halogen atom, a lower alkyl group, or a lower alkoxy group; R_3 represents a hydrogen atom, a lower alkyl group, or a lower hydroxyalkyl group; R_4 represents a hydrogen atom or a lower alkyl group; R_6 represents a phenyl group which may have a substituent selected from a halogen atom, a lower alkyl group and a lower alkoxy group; and A represents a $-CH_2-$ group.

4,136,189

2-(5-NITRO-FURFURYLIDENE)-AMINO-BENZIMIDOLES AND FUNGICIDAL COMPOSITIONS CONTAINING THE SAME

Gèza Tòth, and Istvàn Tòth, both of Budapest, Hungary, assignors to Chinoin Gyógyszer ès Vegyèszeti Termékek Gyàra R.T., Budapest, Hungary

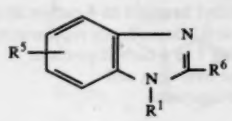
Filed Sep. 10, 1976, Ser. No. 722,087

Claims priority, application Hungary, Sep. 16, 1975, CI 1605

Int. Cl.[2] C07D *405/12;* A61K *31/415*

U.S. Cl. 424—273 R **3 Claims**

1. A compound of the formula I

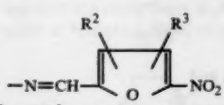


(I)

wherein

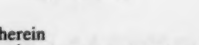
R^5 is hydrogen or C_1 to C_7 alkyl and

R^6 stands for a group of the formula VII



(VII)

wherein R^2 and R^3 are hydrogen or C_1 to C_7 alkyl; and R^1 is a group of the formula VI

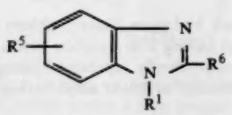


(VI)

wherein

R^4 is phenyl or phenyl substituted with halogen, alkyl of 1 to 7 carbon atoms or alkoxy of 1 to 7 carbon atoms, C_1 to C_7 alkyl or C_3 to C_7 cycloalkyl, and having fungicidal properties; or a fungicidally effective salt thereof.

3. A fungicidal composition comprising, as active ingredient, an effective amount of a compound of the formula I

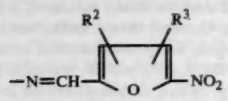


(I)

wherein

R^5 is hydrogen or C_1 to C_7 alkyl and

R^6 is a group of the formula VII



(VII)

wherein R^2 and R^3 are hydrogen or C_1 to C_7 alkyl; and R^1 is a group of the formula VI

(VI)

wherein

R^4 is phenyl or phenyl substituted with halogen, alkyl of 1 to 7 carbon atoms or alkoxy of 1 to 7 carbon atoms, C_1 to C_7 alkyl or C_3 to C_7 cycloalkyl, and having fungicidal properties; or a fungicidally effective salt thereof in admixture with a solid or liquid carrier suitable for fungicidal application.

4,136,190

4,4-DIMETHYL-3,5-PYRROLIDINEDIONES

Frederick Cassidy, Harlow, and Antony W. Lake, Saffron Walden, both of England, assignors to Beecham Group Limited, Great Britain

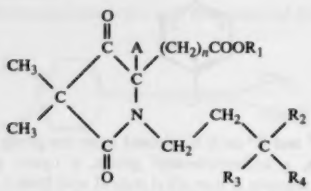
Filed Oct. 15, 1976, Ser. No. 732,989

Claims priority, application United Kingdom, Oct. 25, 1975, 43989/75; May 22, 1976, 21279/76

Int. Cl.[2] A61K *31/40;* **C07D** *207/40*

U.S. Cl. 424—274 **37 Claims**

1. A compound of the formula:



wherein

n is an integer having a value of from 4 to 8;

R_1 is hydrogen, or CO_2R_1 is an ester group in which R_1 contains from 1 to 12 carbon atoms;

R_3 is hydroxy alkanoyloxy of 1 to 4 carbon atoms or benzyloxy;

each of R_2 and R_4 when taken separately is hydrogen, alkyl of 1 to 9 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, cycloalkyl-alkyl of 5 to 8 carbon atoms in the cycloalkyl moiety and 1 to 6 carbon atoms in the alkyl moiety, phenyl-alkyl of 1 to 6 carbon atoms in the alkyl moiety, naphthyl, naphthyl-alkyl of 1 to 6 carbon atoms in the alkyl moiety, said phenyl and naphthyl groups being unsubstituted or substituted by one or more members selected from the group consisting of halogen, trifluoromethyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms and nitro; or R_2 and R_4 when taken with the carbon atom to which they are joined are cycloalkyl of 5 to 8 carbon atoms;

A is hydrogen or methyl;

or an alkali metal, alkaline earth metal, ammonium or substituted ammonium salt of said compound in which R_1 is hydrogen.

32. A pharmaceutical composition having as active agent an effective amount of a compound according to claim **1** to effect anti-gastric secretion activity, anti-hypertensive activity, bronchodilator activity and platelet aggregation inhibition activity and a pharmaceutically acceptable carrier.

4,136,191

COMPOSITION AND METHOD FOR TREATING OR PREVENTING FOWL COCCIDIOSIS

Koji Sakamoto; Takeshi Asano, both of Takasaki; Kazuo Mizuochi, Tokyo; Kanemichi Sasaki, Koshigaya, and Kouji Hasegawa, Omiya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha and Chugai Seiyaku Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 18, 1978, Ser. No. 870,487

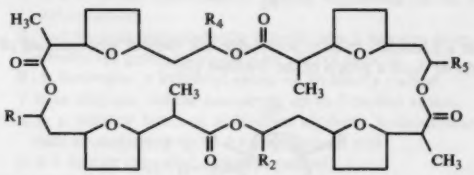
Claims priority, application Japan, Jan. 21, 1977, 52-4979

Int. Cl.[2] A61K *31/365*

U.S. Cl. 424—279 **10 Claims**

1. A method for preventing or treating fowl coccidiosis, which comprises administering to the fowl an effective amount of an antibiotic substance of the macrotetrolide type.

5. A method for preventing or treating fowl coccidiosis, which comprises administering to a fowl an effective amount of at least one antibiotic substance of the macrotetrolide type represented by the general formula



wherein R_1, R_2, R_3 and R_4 each represents a methyl or ethyl group.

4,136,192

4-HYDROXY-3-NITRO (CYANO) COUMARINS

Derek R. Buckle, Redhill, and Harry Smith, Maplehurst, Nr. Horsham, both of England, assignors to Beecham Group Limited, United Kingdom

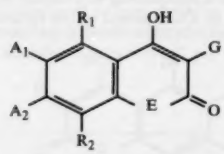
Continuation-in-part of Ser. No. 722,868, Sep. 13, 1976, abandoned. This application Mar. 22, 1977, Ser. No. 780,246

Claims priority, application United Kingdom, Sep. 23, 1975, 39041/75; Sep. 23, 1975, 39042/75; Feb. 4, 1976, 4321/76; Jun. 12, 1976, 24450/76; May 22, 1976, 21276/76; May 22, 1976, 21277/76

Int. Cl.[2] A61K *31/37;* **C07D** *311/56*

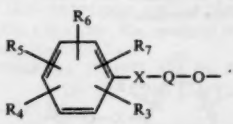
U.S. Cl. 424—281 **101 Claims**

1. A compound of the formula (I)



(I)

or a pharmaceutically acceptable salt thereof wherein one of A_1 or A_2 is a group of the formula (II)

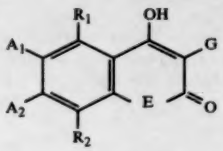


(II)

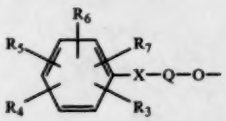
and R_1, R_2 and the one of A_1 or A_2 which does not represent a group of the formula (II) are the same or different and each is hydrogen, lower alkyl, lower alkoxy, lower alkenyl or lower alkynyl; provided that at least one of R_1, R_2, A_1 and A_2 is hydrogen, E is oxygen; G is nitro or cyano; X is oxygen; and Q is alkylene of 1 to 8 carbon atoms inclusive, 1 methylene

group within the group Q, other than a methylene covalently bound to an ether oxygen, being unsubstituted or substituted by hydroxyl, and R_3, R_4, R_5 R_6 and R_7 are each hydrogen, halogen, nitro, hydroxy, cyano, carboxyl, amino, lower alkyl, lower alkenyl, lower alkynl, lower alkoxy, lower alkoxy carbonyl, lower alkanoyl, lower alkanoyloxy, mono or di-lower alkyl amino, mono or di-lower alkanoylamino, phenyl, lower alkylphenyl, phenoxycarbonyl, or benzyloxycarbonyl.

30. A pharmaceutical composition useful for the inhibition in humans of the release of mediators of the allergic response and for the inhibition in humans of the action of said mediators which comprises an effective amount of a compound of the formula (I):

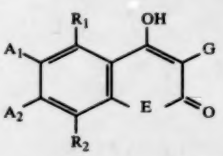


or a pharmaceutically acceptable salt thereof wherein one of A_1 or A_2 is a group of the formula (II):

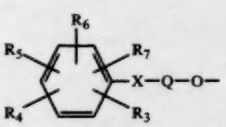


and R_1, R_2 and the one of A_1 or A_2 which does not represent a group of the formula (II) are the same or different and each is hydrogen, lower alkyl, lower alkoxy, lower alkenyl or lower alkynyl; provided that at least one of R_1, R_2, A_1 and A_2 is hydrogen, E is oxygen; G is nitro or cyano; X is oxygen; and Q is alkylene of 1 to 8 carbon atoms inclusive, 1 methylene group within the group Q, other than a methylene covalently bound to an ether oxygen, being unsubstituted or substituted by hydroxyl, and R_3, R_4, R_5, R_6 and R_7 are each hydrogen, halogen, nitro, hydroxy, cyano, carboxyl, amino, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxy carbonyl, lower alkanoyl, lower alkanoyloxy, mono- or di-lower alkyl amino, mono- or di-lower alkanoyl amino, phenyl, lower alkylphenyl, phenoxycarbonyl, or benzyloxycarbonyl.

67. A method of inhibiting mediators of allergic response in humans and for inhibiting in humans the action of said mediators which comprises administering to a human in need thereof an effective amount of a compound of the formula (I):



or a pharmaceutically acceptable salt thereof wherein one of A_1 A_2 is a group of the formula (II):



and R_1, R_2 and the one of A_1 or A_2 which does not represent a group of the formula (II) are the same or different and each is hydrogen, lower alkyl, lower alkoxy, lower alkenyl or lower alkynyl; provided that at least one of the R_1, R_2, A_1 and A_2 is hydrogen, E is oxygen; G is nitro or cyano; X is oxygen; and Q is alkylene of 1 to 8 carbon atoms inclusive, 1 methylene group within the group Q, other than a methylene covalently bound to an ether oxygen, being unsubstituted or substituted by hydroxyl, and R_3, R_4, R_5, R_6 and R_7 are each hydrogen, halogen, nitro, hydroxy, cyano, carboxyl, amino, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxy carbonyl, lower alkanoyl, lower alkanoyloxy, mono- or di-lower alkyl amino, mono- or di-lower alkanoyl amino, phenyl, lower alkylphenyl, phenoxycarbonyl, or benzyloxycarbonyl, in combination with a pharmaceutically acceptable carrier.

4,136,193

ANTI-DEPRESSIVE SUBSTITUTED 1-DIMETHYLAMINOPROPYL-1-PHENYL PHTHALANS

Klaus P. Bøgesø, Kgs. Lyngby, and Anders S. Toft, Farum, both of Denmark, assignors to Kefalas A/S, Copenhagen-Valby, Denmark

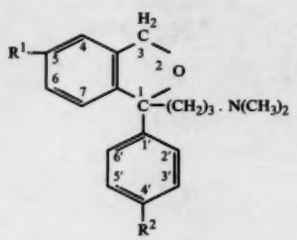
Filed Jan. 7, 1977, Ser. No. 757,619

Claims priority, application United Kingdom, Jan. 14, 1976, 1486/76

Int. Cl.[2] **A61K** *31/34*

U.S. Cl. 424—285 **18 Claims**

1. A compound selected from the group consisting of (1) a phthalane of the general formula:



I

wherein R^1 and R^2 each is selected from the group consisting of halogen, a trifluoromethyl group, a cyano group and R—CO—, wherein R is an alkyl radical with from 1–4 C-atoms inclusive, and (2) an acid addition salt thereof with a pharmaceutically acceptable acid.

13. A pharmaceutical composition in unit dosage form useful in treating depression comprising a major quantity of a pharmaceutical carrier and as an active ingredient a pharmaceutically effective dose of a compound as defined in claim **1**.

4,136,194

2-PHENYL-2-CARBOXYETHYL 1-(P-CHLOROBENZOYL)-5-METHOXY-2-METHYL-3-INDOLYLACETATE AND PROCESS FOR PREPARATION THEREOF

Ludmila Fisnerova; Jaroslava Grimova; Zdenek Roubal, and Oldrich Nemecek, all of Prague, Czechoslovakia, assignors to SPOFA, United Pharmaceutical Works, Prague, Czechoslovakia

Filed Jun. 30, 1977, Ser. No. 811,881

Claims priority, application Czechoslovakia, Jun. 30, 1976, 4324-76

Int. Cl.[2] **C07D** *209/30;* **A61K** *31/405*

U.S. Cl. 424—274 **2 Claims**

1. 2-Phenyl-2-carboxyethyl 1-(p-chlorobenzoyl)-5-methoxy-2-methyl-3-indolylacetate.

2. Anti-inflammatory composition for the treatment of mammals in need thereof, consisting essentially of 2-phenyl-2-carboxyethyl 1-(p-chlorobenzoyl)-5-methoxy-2-methyl-3-indolylacetate as the active ingredient in combination with a pharmaceutical excipient and auxiliary.

4,136,195

INSECTICIDAL CYCLOPROPANE CARBOXYLATES

Julien Warnant, Neuilly-sur-Seine; Jacques Prost-Maréchal, Paris, and Philippe Cosquer, Saint-Denis, all of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 22, 1977, Ser. No. 789,842

Claims priority, application France, Apr. 23, 1976, 76 12094

Int. Cl.[2] A01N *9/20*; C07C *121/ 66*

U.S. Cl. 424—304 3 Claims

1. (S) α-cyano-3-phenoxy-benzyl 2,2-dimethyl-3R-(2,2-dichlorovinyl)-cyclopropane-1R-carboxylate.

3. A method of combatting insects comprising contacting insects with an insecticidally effective amount of (S) α-cyano-3-phenoxybenzyl 2,2-dimethyl-3R-(2,2-dichlorovinyl)-cyclopropane-1R-carboxylate.

4,136,196

HYPOGLYCAEMICALLY ACTIVE 2-(PHENYLALKYL- OR -ALKENYL HYDRAZONO)-PROPIONIC ACID DERIVATIVES

Rainer Haeckel; Michael Oellerich, both of Hanover; Ruth Heerdt, Mannheim-Feudenheim; Manfred Hubner, Ludwigshafen am Rhein, and Hans Kuhnle, Mannheim-Neuostheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

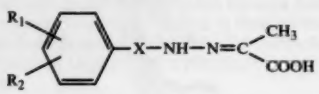
Filed Sep. 22, 1977, Ser. No. 835,939

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643303; Jun. 10, 1977, 2726210

Int. Cl.[2] A61K *31/195*; C07C *101/28*

U.S. Cl. 424—319 8 Claims

1. A 2-hydrazono-propionic acid derivative of the formula:



wherein

R_1 and R_2, each independently is hydrogen, halogen, trifluoromethyl, alkyl of up to 3 carbon atoms, hydroxyl, alkanoyloxy of up to 4 carbon atoms or alkoxy of up to 3 carbon atoms or together are methylene-dioxy, and

X is an aliphatic hydrocarbon radical containing 2–4 carbon atoms and is optionally substituted by an alkyl radical of up to 3 carbon atoms in the β- or δ-position to the nitrogen atom,

or a physiologically compatible salt, lower alkyl ester or amide thereof.

4,136,197

HYPOGLYCAEMICALLY AND HYPOLIPIDAEMICALLY EFFECTIVE N-SUBSTITUTED CARBOXYLIC ACID AMIDES

Manfred Hübner, Ludwigshafen am Rhein; Ruth Heerdt, Mannheim-Freudenheim; Elmar Bosies, Heppenheim; Hans Kühnle, Mannheim-Neuostheim, and Felix H. Schmidt, Mannheim-Seckenheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

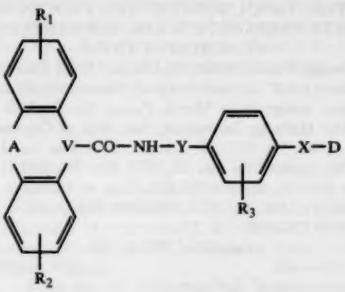
Filed Apr. 6, 1977, Ser. No. 785,255

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2629752

Int. Cl.[2] C07C *63/44*; A01N *09/20*

U.S. Cl. 424—319 16 Claims

1. An N-substituted carboxylic acid amide of the formula



where

A is a valency bond or a methylene, ethylene or vinylene radical,

V is a trivalent hydrocarbon radical containing up to 4 carbon atoms,

R_1 and R_2 each independently is hydrogen, a halogen atom, a hydroxyl group or an alkyl or alkoxy radical,

R_3 is hydrogen, a hydroxyl group or an alkoxy radical,

Y is an alkylene radical containing up to 3 carbon atoms,

X is a valency bond or a divalent aliphatic hydrocarbon radical containing up to 6 carbon atoms, and

D is a free or esterified carboxyl radical,

or a physiologically compatible salt thereof.

4,136,198

METHOD FOR THE CONTROL OF TRYPANOSOMIASIS

Allen B. Clarkson, Jr., and Fredrick H. Brohn, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,156

Int. Cl.[2] A61K *31/16*

U.S. Cl. 424—320 2 Claims

1. A method of combatting trypanosomiasis comprising administering parenterally to an infected host a composition comprising 138 to 276 mg/kg body weight of glycerol and from 96 to 191 mg/kg of an iron chelating agent selected from the group consisting of halobenzohydroxamic acid, and pharmaceutically acceptable salts thereof, per day.

4,136,199

METALLIC ION REMOVAL FROM PHOSPHORIC ACID

Harold E. Mills, Lake City, Fla., assignor to Occidental Chemical Company, Houston, Tex.

Filed Jun. 27, 1977, Ser. No. 810,484

Int. Cl.[2] C01B *25/18*

U.S. Cl. 423—321 R 21 Claims

1. A process for the removal of at least one metallic ion impurity from phosphoric acid comprising the steps of:

(a) adding to the acid a sludge precipitant comprising at least 50% by weight calcium fluoride on a dry basis;

(b) allowing the formation of a precipitate containing the impurity; and

(c) separating the precipitate from the acid.

4,136,200

PHENYLBUTANOL DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Erich Schacht; Werner Mehrhof; Albrecht Wild; Joachim Gante, and Hans-Adolf Kurmeier, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

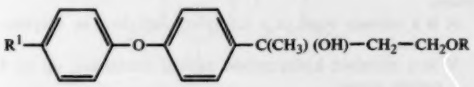
Division of Ser. No. 552,959, Feb. 25, 1975, Pat. No. 4,049,823. This application Jun. 28, 1977, Ser. No. 810,712

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1974, 2409761; Jun. 14, 1974, 2428686; Jul. 3, 1974, 2431951; Jul. 26, 1974, 2436012

Int. Cl.[2] C07C *43/20*

U.S. Cl. 424—341 **7 Claims**

1. A compound of the formula



wherein R is H or alkanoyl of 1 to 6 carbon atoms and R^1 is F, Cl or Br.

4,136,201

MICROBIAL RENNIN

Louis I. Feldman, Spring Valley, N.Y., assignor to GB Fermentation Industries, Inc., Kingstree, S.C.

Continuation of Ser. No. 688,349, Dec. 6, 1967, abandoned, which is a continuation-in-part of Ser. No. 631,608, Apr. 18, 1967, abandoned. This application Dec. 14, 1977, Ser. No. 860,636

Int. Cl.[2] A23C *19/02*; C12D *13/10*

U.S. Cl. 426—36 **6 Claims**

1. A microbial rennin having relatively high milk coagulating activity and relatively low proteolytic activity and being relatively free from lipase obtained by cultivating a selected strain of *Mucor miehei* (NRRL No.'s: 3169, A7772, A13131, A13042, and 2543) in a medium containing available carbon, nitrogen and trace nutrients and fermenting under aerobic conditions.

4,136,202

CAPSULE FOR BEVERAGE PREPARATION

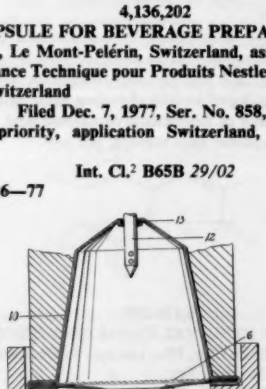
Eric Favre, Le Mont-Pelérin, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., La Tour de Peilz, Switzerland

Filed Dec. 7, 1977, Ser. No. 858,347

Claims priority, application Switzerland, Dec. 17, 1976, 15913/76

Int. Cl.[2] B65B *29/02*

U.S. Cl. 426—77 **2 Claims**



1. A capsule containing a substance for making up a drink using an apparatus of the type which includes a water-injection piercing member which injects water into the capsule under pressure, said capsule being composed essentially of a sealed impervious body containing said substance and having the general shape of an upright acute truncated cone, the top of the body terminating into a generally domed end, said domed end having a recess for receiving said water-injection piercing member, the height of said body being approximately the same as the base dimension thereof, said body being provided at said base with an outer rim, a membrane defining a base closure member, and a filter interposed between said membrane, and said substance said membrane being resilient and bulging outwarding under the pressure of water injected into said capsule through said piercing member, said membrane being provided with an integral portion at least partially surrounded by a grooved line of weakness which brakes away from said membrane under the influence of the water pressure when said membrane is in bulged condition thereby forming an aperture in the membrane through which the drink will flow from the capsule.

4,136,203

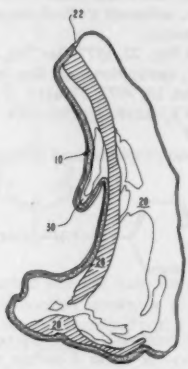
MEAT PACKAGING

Robert E. Murphy, Downers Grove, and Harry F. Bernholdt, Lombard, both of Ill., assignors to Swift & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 703,593, Jul. 8, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,421

Int. Cl.[2] B65D *33/02*

U.S. Cl. 426—124 **17 Claims**



1. An improved meat package, said package comprising: a meat item encased in a wrapper, said meat item having surface area potentially capable of puncturing said wrapper; and a cushion film interposed between said surface areas and said wrapper, said cushion film comprising a layer of flexible and resilient foam material and an oxygen impermeable surface covering disposed between said layer and said surface areas.

4,136,204

PROCESS FOR BLEACHING DARK FISH MEAT

Allan R. Hughes, Billericay; Joseph E. McCrudden, Warrington, and Barry J. R. Mayes, Grimsby, all of England, assignors to Interox Chemicals Limited, London, England

Continuation of Ser. No. 685,187, May 11, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,231

Claims priority, application United Kingdom, May 13, 1975, 20031/75

Int. Cl.[2] A22C *25/00*; A23L *1/277*

U.S. Cl. 426—261 **5 Claims**

1. A process for fish bleaching comprising the steps of contacting dark fish meat in the undissolved state with a dilute aqueous solution containing from 0.5 to 1.0% by weight of hydrogen peroxide at an initial pH of from 10.5 to 11 and at a temperature of from 10° C to ambient for a period of from 10 to 20 minutes, separating the fish meat from the solution re-

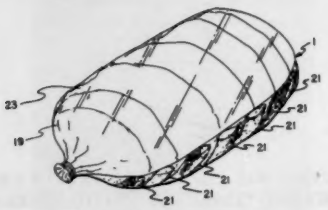
moving any residual hydrogen peroxide from the fish and adjusting the pH of the fish to from about 6 to 7.

4,136,205

CONTAINER AND METHOD FOR PACKAGING MEAT ARTICLES

Robert W. Quattlebaum, Lyman, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Mar. 30, 1977, Ser. No. 782,818
Int. Cl.[2] B65B *53/02*; B65D *33/02*
U.S. Cl. 426—412 **14 Claims**



1. A container for packaging meat articles having protruding bone sections therein, comprising:

a body portion of flexible material having two sides which merge at one end of the body portion to define a closed end and which define a single opening located opposite said closed end, said body portion being capable of enveloping one of said articles; and

a layer of material more puncture resistant than said flexible material disposed within said body portion and being attached to one of said sides adjacent said opening and being unattached adjacent said closed end and terminating adjacent said closed end such that the area between said layer and said one of said sides is in fluid communication with said single opening, through said unattached part of said layer, said layer having a plurality of apertures therethrough.

4,136,206

METHOD OF OBTAINING A SMOKING AGENT

Janusz Kulesza; Kazimierz Miler, both of Warsaw; Jerzy Podlejski; Józef Góra, both of Lódz; Teresa Czajkowska; Zbigniew Kozlowski, both of Warsaw; Jadwiga Kolska, Kolo; Jolanta Stolowska, Lodz, and Zygmunt Rutkowski, Warsaw, all of Poland, assignors to Politechnika Lodzka, Instytut Brzemyuslu Miesnego, Warsaw, Poland

Continuation of Ser. No. 551,416, Feb. 20, 1975, abandoned.
This application Mar. 28, 1977, Ser. No. 782,303
Claims priority, application Poland, Feb. 22, 1974, 169004
Int. Cl.[2] A23L *1/232*
U.S. Cl. 426—431 **37 Claims**

1. A method of obtaining a smoking agent from a smoke condensate obtained from the destructive distillation of cellulosic or lignin material comprising extracting the smoke condensate with extracting amounts of aqueous solution of a mineral acid to remove organic nitric bases thereby leaving a purified condensate and then effecting a two-stage distillation of said purified condensate under reduced pressure in an inert gas atmosphere in the presence of anti-oxidative amounts of zinc dust, aluminum dust or iron dust added to said purified condensate, the first stage of the distillation being conducted at a pressure of 20–30 mm Hg to yield a residue and a fraction constituting technological waste containing substances having a boiling point below 100–110° C. at 20–30 mm Hg, the second stage of the distillation being effected on said residue from the first stage of distillation and being conducted at a pressure lower than the first stage and not exceeding 20 mm Hg in the presence of extractive distillation amounts of polyhydric alcohol added to said residue obtained from the first stage, to otain a fraction containing compounds exhibiting a boiling point of up to 250° C. at 20 mm Hg, said fraction from the second stage constituting the smoking agent in admixture with polyhydric alcohol, heating said mixture to a temperature of 50–90° C. to form an alcohol layer and a layer of smoking agent, and separating said layer of smoking agent.

4,136,207

METHOD OF TREATING LIGNOCELLULOSE MATERIALS TO PRODUCE RUMINANT FEED

Robert Bender, Ottawa, Canada, assignor to Stake Technology Ltd., Ottawa, Canada

Filed Jan. 24, 1977, Ser. No. 762,095
Int. Cl.[2] A23K *1/12, 1/18*; D21B *1/36*; D21C *3/24*
U.S. Cl. 426—510 **8 Claims**

1. A process for preparing cellulosic material of enhanced digestibility by ruminants, which comprises the steps of:

initially mechanically compacting a lignocellulose material selected from the group consisting of hardwood wood chips and sawdust, said lignocellulose material having a moisture content at or above the fiber saturation point:

continuously feeding the compacted lignocellulose material to a pressure withstanding digestor vessel;

subjecting said compacted lignocellulose material to sudden increase in pressure by exposure to saturated steam, at a pressure of at least 200 psig, in said digestor vessel;

conveying said lignocellulose material through said digester vessel while maintaining said lignocellulose material in contact with saturated steam, at a pressure of at least 200 psig for a period of at least 15 seconds, and in the absence of added chemical reagents other than said steam whereby a cooked and digested ligno-cellulose materials is obtained;

mechanically compacting the cooked and digested lignocellulose material while under said saturated steam pressure of at least 200 psig and adjusting or maintaining the free moisture content thereof at or above the fiber saturation point;

subjecting small portions of the cooked and digested and mechanically compacted lignocellulose material successively in a continuous manner to rapid reduction in pressure down to atmospheric pressure in a time interval of not more than 0.1 secs. resulting in cooling of said material; and then

continuously recovering said lignocellulose material in a condition of enhanced digestibility by reminants.

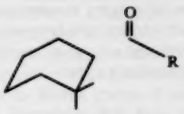
4,136,208

FLAVORING WITH SUBSTITUTED NORBORNANE DERIVATIVES

Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853.
This application Dec. 13, 1977, Ser. No. 860,137
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—538 **6 Claims**

1. A process for augmenting or enhancing the flavor or aroma of a foodstuff comprising adding to said foodstuff from about 0.5 ppm up to about 500 ppm of at least one compound defined according to the structure:



wherein R is alkyl selected from the group consisting of n-propyl and n-butyl.

4,136,209

PROCESS FOR THE PRODUCTION OF A PECTIN PREPARATION AND FOR THE PRODUCTION OF A FOOD-GRADE GELLING AGENT AND THE GELLING AGENT PREPARED THEREFROM

Gerhard Fox, Neuenbürg, Fed. Rep. of Germany, assignor to Pektin-Fabrik Hermann Herbstreith KG, Neuenbürg, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,813

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708404

Int. Cl.[2] A23L *1/06, 1/04*

U.S. Cl. 426—577 **22 Claims**

1. A process for the production of a pectin preparation based on fruit pectin suitable for the production of jellies with a low solids content comprising:

(a) preparing a solution of a pectin which has a metal binding power of 30–140 g of metal salt, calculated as $CaCl_2$, per kilogram of pectin with a degree of esterification of 30–40%, with water and a phosphate selected from the group consisting of orthophosphates, pyrophosphates, and polyphosphates at a temperature between 10° and 90° C. to obtain a pH value between 4.4 and 4.8;

(b) adding a salt of a metal selected from the group consisting of soluble calcium, magnesium, aluminum, iron and mixtures thereof in dry or dissolved form to the solution with stirring, the amount of the salt corresponding stoichiometrically to 30 to 140 g of $CaCl_2$/kg of pectin, and

(c) precipitating the pectin preparation formed from the solution and drying the precipitate.

4,136,210

PROCESS FOR PRODUCTION OF TEXTURAL PROTEIN FOOD MATERIAL FROM KRILLS

Akinori Noguchi, Tokyo; Susumu Kimura, Tachikawa, and Keiji Umeda, Tokyo, all of Japan, assignors to Director of National Food Research Institute, Tokyo, Japan

Filed Oct. 26, 1977, Ser. No. 845,535

Claims priority, application Japan, Jun. 17, 1977, 52-71088

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—657 **9 Claims**

1. A process for producing textural protein food material from krills which comprises mixing uniformly the flesh of the krills, centrifuging the resulting mixture to obtain a precipitate, adjusting the pH of the precipitate to not less than 10, returning the pH to near neutral, and freezing the precipitate to effect texturing thereof.

4,136,211

METHOD OF MAKING BEARING MATERIALS

Harold E. Sliney, Parma, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 764,245, Jan. 31, 1977, which is a division of Ser. No. 616,528, Sep. 25, 1975, abandoned, which is a division of Ser. No. 513,611, Oct. 10, 1974, Pat. No. 3,953,343. This application Dec. 13, 1977, Ser. No. 860,406

Int. Cl.[2] B05D *1/00, 1/08*

U.S. Cl. 427—34 **7 Claims**

1. A method for fabricating a self-lubricating, oxidation-resistant article comprising the steps of

forming a frit of a glass capable of inhibiting oxidation in a metal capable of providing strength and elasticity to a temperature up to and in excess of about 930° C.,

mixing said glass frit with powders of said metal and powders of a fluoride salt capable of providing lubrication thereby forming a composition of matter,

co-depositing the mixture of said metal, said fluoride salt and said glass on a substrate by means of plasma-arc spraying to form a coating having a thickness from about 0.010 centimeter to about 0.060 centimeter, and

machining said coating to a thickness between about 0.005 centimeter and about 0.050 centimeter.

4,136,212

METHOD FOR THE PRODUCTION OF LIGHT CONDUCTOR STRUCTURES WITH INTERLAYING ELECTRODES

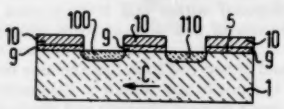
Franz Auracher, Munich, and Guido Bell, Gilching, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 8, 1977, Ser. No. 804,491

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1976, 2626516

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—38 **9 Claims**



1. A method of forming a light conductor structure having a pair of light conductors embedded in one surface of a substrate of an electro-optical material having its c-axis extending parallel to the one surface and at right angles to the light conductors and having electrodes extending between the light conductors, said structure being particularly adapted for use as an electrically controllable coupler, said method comprising the steps of providing a substrate of the electro-optical material having said one surface; applying a layer of polycrystalline silicon on said one surface of the substrate; removing a portion of the silicon layer from said one surface by etching to provide silicon-free portions of said one surface having a configuration of the light conductors, which are to be formed, with the remaining portions of the silicon layer forming a mask; applying a layer of diffusion material on the silicon layer and said silicon-free portions of said one surface of the substrate; diffusing the diffusion material into the surface of the substrate at said silicon-free portions to form light conductors having an index of refraction greater than the index of refraction of the substrate by heating to an elevated temperature; cooling the substrate; applying a layer of negative acting photo-lacquer to the light conductors and the layer of diffusion material; exposing said layer of negative acting photo-lacquer by projecting light through the substrate with the remaining portions of the silicon layer acting as a mask; developing the layer of photo-lacquer so that the unexposed portions are removed and the remaining portions of the lacquer cover the light conductors; removing the remaining portions of the silicon layer with the diffusion layer thereon from said one surface; applying a metal layer on said one surface to form the electrodes and then removing the photo-lacquer strips with the metal deposited thereon from the light conductors.

4,136,213
CARBON ARTICLE INCLUDING ELECTRODES AND METHODS OF MAKING THE SAME

Shun C. Fung, Edison, and Samuel J. Tauster, Englishtown, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

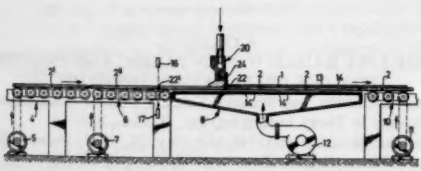
Continuation of Ser. No. 622,895, Oct. 16, 1975, abandoned, which is a division of Ser. No. 458,543, Apr. 8, 1974, Pat. No. 3,964,933. This application Feb. 4, 1977, Ser. No. 765,765
Int. Cl.[2] H01M *8/02*; B05D *5/12, 3/10*
U.S. Cl. 427—122 3 Claims

1. A process of forming an electrically conductive carbon composition comprising thermally decomposing a carbonaceous material in the presence of an oxide, said carbon being deposited in an amount ranging from about 2 wt.% to about 12 wt.%, thereby carbonizing the oxide, said oxide being selected from acid soluble oxides which remain nonconductive after being carbonized, and thereafter treating said carbonized nonconductive oxide with acid to render the composition electrically conductive.

4,136,214
METHOD OF FORMING FILM

Claude Bourelier, Paris; Roger Orain, Vaucresson, both of France; Rudolf Pelzer, Herzogenrath, Fed. Rep. of Germany; Wolfgang Schaefer, and Siegfried Schindler, both of Aachen, Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jun. 14, 1977, Ser. No. 806,453
Claims priority, application France, Jun. 18, 1976, 76 18543
Int. Cl.[2] B05D *1/26*
U.S. Cl. 427—169 12 Claims



1. In a method for making films by depositing, from a flow head, a layer of flowable material onto a moving substrate formed of a series of panels arranged in end-to-end abutting relationship and maintaining the substrate continuous by adding panels successively to the series of panels, the improvement comprising abutting each newly added panel with the endmost panel in the series of panels when a joint between preceding panels in the series is beneath the flow head.

4,136,215
PROCESS FOR PREPARING A COATED, THERMOSETTING PLASTIC FOAM HAVING IMPROVED PROPERTIES

Marinus J. A. M. den Otter, Munstergeleen, and Anne te Nijenhuis, Brunssum, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jan. 15, 1976, Ser. No. 649,521
Claims priority, application Netherlands, Jan. 17, 1975, 7500548
Int. Cl.[2] B05D *1/36*
U.S. Cl. 427—204 12 Claims

1. A process for preparing a foamed thermosetting composition containing at least a surface layer of particulate particles embedded therein including the successive steps of:

(1) distributing a foamable thermosetting liquid composition onto an adhering surface;

(2) at least partially initiating the foam curing of said thermosetting composition;

(3) thereafter evenly distributing on the exposed surface of the partially formed foam of step (2) a thin, continuous layer of inert, initially non-coherent particulate material; and

(4) completing the foaming and curing of the thus coated thermosetting composition,

whereby the inert, non-coherent particles are applied to the foam in step (3) at a time in which the foam composition is both adhesive to and at least partially penetrated by the contacted particulate material such that the foam, while still foaming, grows up and around the deposited particles, forming a continuous surface continuously having said inert particulate material distributed therethrough and integrally connected to the now-cured foamed structure of said thermosetting composition, said layer containing said particles having a discrete thickness extending within the said foamed structure.

4,136,216
NON-PRECIOUS METAL COLLOIDAL DISPERSIONS FOR ELECTROLESS METAL DEPOSITION

Nathan Feldstein, Princeton, N.J., assignor to Surface Technology, Inc., Princeton, N.J.

Division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 512,224, Oct. 4, 1974, abandoned. This application Oct. 12, 1976, Ser. No. 731,212
The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.
Int. Cl.[2] C23C *3/02*
U.S. Cl. 427—306 45 Claims

1. An improved process for the preparation of non-conductor substrates for electroless metal or alloy plating thereon comprising contacting said substrate with a catalytic non-precious metal collcidal composition wherein said catalytic non-precious metal is the admixture of copper and at least one metal selected from the group consisting of nickel, cobalt, and iron and wherein said colloidal composition is formed by interaction of the metal ions with a precipitating agent and wherein said precipitating agent is selected from the group of hypophosphorus acid and its derivatives and hydroxyl ions.

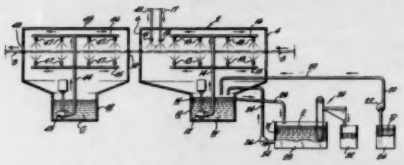
4,136,217
REMOVING OIL EMULSION FROM ARTICLES PRIOR TO COATING ARTICLES AND RECOVERING OIL FROM THE EMULSION

Thomas D. Henley, Havertown, Pa., assignor to Amchem Products, Ambler, Pa.

Filed Jan. 27, 1977, Ser. No. 763,217
Int. Cl.[2] C23G *5/00*
U.S. Cl. 427—327 17 Claims

1. In a continuous process wherein oil emulsion is removed from the surfaces of a plurality of articles by contacting the surfaces with an aqueous solution containing an oil insoluble

demulsifier for breaking said oil emulsion and wherein said surfaces having said oil emulsion removed therefrom are subsequently contacted with a cleaning solution and wherein the cleaning solution is recycled for contacting additional of said surfaces and wherein precipitates tend to be formed in said



recycled cleaning solution, the improvement comprising contacting said surfaces having thereon said oil emulsion with said aqueous solution having included therein a chelating agent in an amount sufficient to deter the formation of said precipitates, said chelating agent being capable of chelating alkaline earth metal ions.

4,136,218

PROCESS FOR THE IMPROVEMENT OF THE WATER-ABSORBING CAPACITY AND THE ABSORPTIVITY OF TEXTILE MATERIALS

Ehrenfried Nischwitz, Schmitten-Oberreifenberg; Arno Holst, Wiesbaden; Ottokar Smerz, Kelkheim, Taunus; Michael Kostrzewa, and Helmut Lask, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

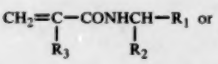
Filed Aug. 27, 1975, Ser. No. 608,046

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1974, 2441781

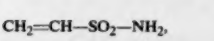
Int. Cl.[2] B05D *3/10*

U.S. Cl. 427—339 **5 Claims**

1. Process for improving the water-absorbing capacity and absorptivity of fibrous materials containing synthetic fibers or filaments, which comprises applying modified, highly absorbing cellulose ethers onto the fibrous materials and fixing said cellulose ethers thereon with the aid of carbamate-based, linear or cyclic urea-formaldehyde reactants or acrylic acid ester- or vinylacetate-based copolymers containing reactive groups, said cellulose ethers being carboxymethyl cellulose, carboxymethyl-hydroxyethyl cellulose, methylhydroxyethyl cellulose or hydroxyethyl cellulose which are modified with a compound of the formula



or



in which in the first formula

R_1 is hydroxyl, alkanoylamino or alkoxycarbonylamino,

R_2 is hydrogen or carboxy and

R_3 is hydrogen or methyl.

4,136,219

METHOD OF APPLYING POLYURETHANE PAINT TO VULCANIZED RUBBER

Norman E. Odam, Vanderweydendreef 29, 1900-Overijse, and Bernard Costemalle, 15 Ave. Valentin Tandeur, 1610-Waterloo, both of Belgium

Continuation of Ser. No. 630,149, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 441,404, Feb. 11, 1974, abandoned. This application Mar. 18, 1977, Ser. No. 779,277

Claims priority, application United Kingdom, Feb. 9, 1973, 6445/73

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—385 B **5 Claims**

1. The process of applying a polyurethane paint to a vulcanized rubber surface, said vulcanized rubber being selected from the group consisting of halogenated butyl rubber and blends of same with a rubber selected from the group consisting of natural rubber, styrene butadiene rubber, EPDM rubber, polybutadiene rubber, acrylonitrile butadiene rubber, polychloroprene rubber, synthetic polyisoprene rubber, or chloro sulfonated polyethylene rubber, said blends containing at least 30 parts of halogenated butyl rubber per hundred parts by weight of vulcanized rubber, said rubber having been cured using a metal oxide or halide and an alkyl phenol polysulfide accelerator, said process consisting essentially of the step of applying said paint to the cured rubber surface, said rubber surface being substantially unmodified after curing whereby good adhesion of said paint on said surface is obtained.

4,136,220

PROCESS FOR THE MOLDING OF PLASTIC STRUCTURAL WEB AND THE RESULTING ARTICLES

Olagoke Olabisi, Plainfield, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,101

Int. Cl.[2] B32B *3/00*; B29C *17/06*

U.S. Cl. 428—35 **7 Claims**

1. A molded structural web article of plastic material comprising a substantially continuous molded integral, strong, enveloping exterior skin having major sections and connecting side wall sections, a generally continuous hollow center therein, and a plurality of integral skin-connecting webs positioned in said hollow center and projecting from the interior of a side wall section into the hollow interior of said article to connect and support portions of the major sections of the structural web article, said skin-connecting webs not interconnecting with each other.

4,136,221

SUEDE-LIKE RAISED WOVEN FABRIC AND PROCESS FOR THE PREPARATION THEREOF

Miyoshi Okamoto, and Syusuke Yoshida, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 745,161, Nov. 26, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 857,354

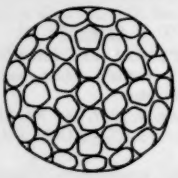
Claims priority, application Japan, Jul. 17, 1976, 51-70379

Int. Cl.[2] B29D *27/00*; D04H *1/64*

U.S. Cl. 428—91 **27 Claims**

1. A suede-like raised woven fabric of a combination weave having raised fibers covering the surface of said fabric, which fabric comprises a 30 to 300 denier yarn consisting mainly of continuous filaments, the mono-filament denier of which is 1.0 to 8.0 denier, used as warp, a 50 to 1,000 denier yarn of a bundle comprising continuous extra fine filaments, the mono-

filament denier of which is 0.0001 to 0.4 denier, used as a first weft and a 30 to 300 denier yarn consisting mainly of continuous filaments, the mono-filament denier of which is 1.0 to 8.0



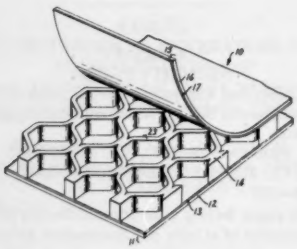
denier, used as a second weft, each thread of said first weft floating toward the adjoining 3 to 7 threads of said warp and said raised fibers consisting of said extra fine filaments which constitute said first weft of said fabric.

4,136,222

THERMALLY INSULATING SHEET MATERIAL

Nelson Jonnes, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 18, 1977, Ser. No. 788,150
Int. Cl.² B32B *3/24, 3/26*
U.S. Cl. 428—116 **14 Claims**



1. A sheet material useful as thermal insulation in garments and the like comprising

(1) at least one thin lightweight drapeable sheet carrying a vapor-deposited layer of specularly reflective material on at least one surface; and

(2) at least one separator layer between about one-fourth and one-and-one-half centimeters thick adhered to said sheet and comprising an open array of resiliently flexible supple and compressible polymeric foam segments having a density less than about 0.5 gram/cubic centimeter, said array of segments covering between about 10 and 60 percent of the area of said sheet and having a maximum span across an open area of the array of no more than about 5 centimeters, and said separator layer exhibiting a reduction in thickness of no more than about 50 percent under a static load of 7 grams/square centimeter and a regain after brief compression at 70 grams/square centimeter of at least about 90 percent.

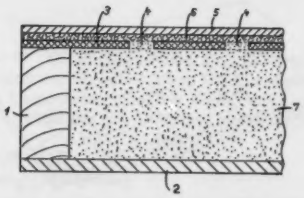
4,136,223

PLATE-SHAPED ROOFING ELEMENT

Sven Harder, Albertslund, Denmark, assignor to A/S Hotaco, Holbaek, Denmark

Filed Apr. 4, 1978, Ser. No. 894,196
Int. Cl.² B32B *3/10*
U.S. Cl. 428—139 **1 Claim**

1. Plate-shaped roofing element comprising: adhesive foam plastic having a surface facing upwards in a mounted position and having a covering plate comprised of bituminous roofing felt with surface facing the element being covered with a layer of gravel or pebbles, and a layer of glass fiber contacting said surface of said roofing felt and having through holes through



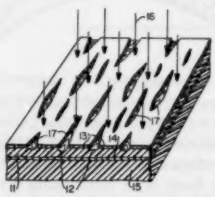
which the adhesive foam plastic during foaming becomes adherent to said bituminous roofing felt.

4,136,224

DECORATIVE LAMINATED STRUCTURES AND METHOD OF MAKING THE SAME

Kazuto Minami, Tokyo; Norihiko Tsukui, Higashikurume, and Tsunehiko Imamoto, Funabashi, all of Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Division of Ser. No. 313,661, Dec. 11, 1972, Pat. No. 3,962,009. This application Sep. 4, 1975, Ser. No. 610,443
Claims priority, application Japan, Dec. 11, 1971, 46-99866; Jan. 13, 1972, 47-05564; Apr. 14, 1972, 47-37600; May 27, 1972, 47-52168
Int. Cl.² B32B *3/30*
U.S. Cl. 428—161 **7 Claims**



1. A decorative laminated structure having a pattern of concaves and convexes and which consists essentially of a composite material of, in layers, a base sheet, a heat-shrinkable resin sheet and a picture layer containing a plurality of heat-sensitive picture areas formed of a heat-sensitive ink composition and contiguous and adhered to said heat-shrinkable resin sheet, said heat-shrinkable resin sheet having formed on the surface thereof concave portions, said concave portions corresponding to said heat-sensitive picture areas of the picture layer.

4,136,225

COVER COATINGS FOR PRINTED CIRCUITS

Eugene D. Feit, Berkeley Heights, and Marguerite E. Wurtz, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 8, 1977, Ser. No. 813,889
Int. Cl.² B32B *7/14*; B05D *5/12*
U.S. Cl. 428—201 **3 Claims**

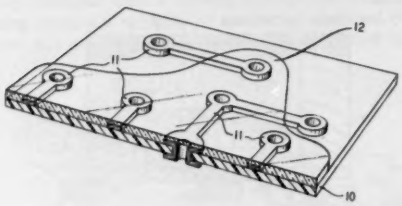
1. An electrical circuit comprising

a flexible substrate

a conductive pattern formed on the substrate and

a protective coating covering portions of the conductive pattern

the invention characterized in that the protective coating comprises a polymer of dichloropropyl acrylate crosslinked with an acrylic crosslinking agent in a weight ratio of 2:1 to 6:1 to yield a flexible coating.

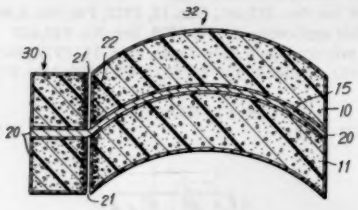


4,136,226

IMPACT-ABSORBING LAMINATE AND METHOD OF MANUFACTURE THEREOF

Richard L. Gilman, Gilman, Conn. 06336

Filed Mar. 23, 1978, Ser. No. 889,243
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—315 **22 Claims**



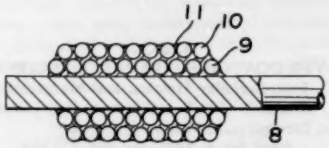
1. A formed impact-absorbing article comprising a relatively stiff, self-supporting, support core having two opposing major surfaces, and at least one impact-absorbing cellular layer, having two opposing major surfaces, one surface of the foam layer being fused to one surface of the support sheet, and the second major surface of the foam layer comprising a relatively high density, relatively impervious, self-skin, the foam layer and the support sheet being formed of ionomer resin.

4,136,227

ELECTRODE OF DISCHARGE LAMP

Masato Saito; Keiji Watanabe, and Keiji Fukuyama, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1977, Ser. No. 852,498
Claims priority, application Japan, Nov. 30, 1976, 51-144337
Int. Cl.[2] H01G *1/01;* H01J *1/14, 1/30*
U.S. Cl. 428—389 **4 Claims**



1. An electrode of a discharge lamp which comprises an electron emission material containing 5–40 wt.% beryllium oxide and 3–35 wt.% yttrium oxide with one or more of barium calcium and strontium components which is coated on a substrate of the electrode wherein the electron emission material comprises less than 60 wt.% of total content of beryllium oxide and yttrium oxide.

4,136,228

COLD PUNCHABLE LAMINATES

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1977, Ser. No. 822,768
Int. Cl.[2] B32B *27/10, 27/42;* C09J *3/14;* B32B *27/08*
U.S. Cl. 428—476 **8 Claims**

1. A cold punchable substantially nonporous laminate construction having low water absorption, fire resistance and high flexural strength comprising an integral combination of at least two cellulosic substrate sheet members arranged face-to-face in a layer sequence, each sheet member being impregnated with, and adhered to the adjoining layer by a thermoset composition consisting essentially of a phenol-aldehyde resole resin and a vinyl chloride interpolymer having comonomers selected from the group consisting of vinylidene chloride, vinyl acetate, acrylate esters, acrylic acid, acrylamide and ethylene or mixtures thereof wherein said laminate is impregnated with from 30-70% by weight of said composition, said composition being about 50 to 70% by weight of said resole resin and about 30 to 50% by weight of said vinyl chloride interpolymer.

4,136,229

SECURITY PAPER

Jean-Yves Godet, and Giampaolo Bartoli, both of Charavines, France, assignors to Societe Anonyme dite: Arjomari-Prioux, Paris, France

Filed Oct. 25, 1977, Ser. No. 845,112
Int. Cl.[2] D21H *5/10;* B41M *3/14;* B44F *1/12*
U.S. Cl. 428—537 **5 Claims**

1. Security paper having incorporated therein from 0.02 to 1 g per square meter of at least one fluorescent dyestuff selected from the group consisting of a pyrenesulfonic acid and a metal salt thereof, said dyestuff not normally affecting the coloration of said paper but exhibiting a fluorescent coloration visible in daylight and in conventional lighting when said paper is contacted by an alkaline reagent.

4,136,230

WEAR RESISTANT ALLOY COATING CONTAINING TUNGSTEN CARBIDE

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 709,705, Jul. 29, 1976, Pat. No. 4,075,371, which is a division of Ser. No. 594,943, Jul. 11, 1975, Pat. No. 4,013,453. This application Sep. 23, 1977, Ser. No. 836,061
Int. Cl.[2] B32B *15/00, 15/16*
U.S. Cl. 428—564 **4 Claims**

1. A coated metal substrate in the form of a wear and abrasion resistant hard facing coating metallurgically bonded thereto,

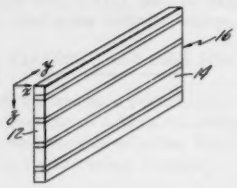
said coating being formed of a nickel-base matrix alloy consisting essentially by weight of about 2.5% to 20% Cr, about 0.5% to 6% Si, about 0.5% to 5% B, up to about 10% Fe and the balance essentially nickel,

said matrix alloy coating having dispersed therethrough a substantially non-segregated fine uniform dispersion of about 10% to 30% by weight of hard particles of tungsten carbide of average size less than about 10 microns at an average interparticle spacing of less than 15 microns and being characterized by substantially improved resistance to wear and abrasion.

4,136,231
SANDWICH PANEL FABRICATION

Edward R. Slaughter, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 640,807, Dec. 15, 1975, Pat. No. 4,020,542.
This application Dec. 17, 1976, Ser. No. 751,556
Int. Cl.[2] B32B *15/00*
U.S. Cl. 428—609 **4 Claims**

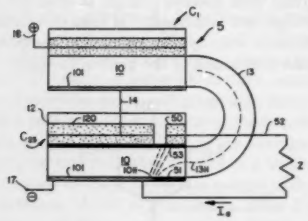


1. A filler assembly for a sandwich panel consisting of a plurality of rib elements interleaved with core elements positioned to hold the rib elements in spaced relation and all bonded together into a unitary structure and with core elements forming the outer elements of the filler assembly, said filler assembly having all rib elements of a uniform thickness and all core elements of a uniform thickness.

4,136,232
ELECTROCHEMICAL GENERATORS WITH AUXILIARY CATHODE

Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 4, 1977, Ser. No. 821,774
Claims priority, application France, Aug. 6, 1976, 51-24468
Int. Cl.[2] H01M *8/00*
U.S. Cl. 429—15 **17 Claims**



1. An electrochemical generator comprising at least two cells, each of the two cells having, on the one hand, at least one anode compartment with at least one anode collector and, on the other hand, at least a main cathode having a cathode-active material, the anode collector of a first of the two cells being connected electrically to the cathode of a second of the two cells, the generator having means for creating, through the anode compartments of the two cells, a flow in series of a liquid electrolyte containing particles formed at least in part of an anode-active metal, the one of the two cells which is traversed first by the flow being the upstream cell and the other being the downstream cell, the anode collector of each of the two cells having two ends, one located upstream and the other downstream with respect to the average direction of flow within the anode compartment in which it is contained, characterized in that the second cell comprises, in addition to said main cathode, at least one auxiliary cathode extending beyond the end of the anode collector of the second cell which is located hydraulically closest to the anode collector of the first cell, the auxiliary cathode thus giving rise to electric current lines which are substantially focused on said hydraulically closest end of the anode collector of the second cell.

4,136,233
CHALCOGENIDE BATTERY

Morris Eisenberg, Mountain View, Calif., assignor to Electrochimica Corporation, Mountain View, Calif.

Filed Jan. 25, 1978, Ser. No. 872,226
Int. Cl.[2] H01M *6/36*
U.S. Cl. 429—112 **19 Claims**

1. A battery comprising:

(a) An anode having an anode-active metal selected from the group consisting of Group Ia metals, Group IIa metals, Group IIb metals, Group IIIa metals, and mixtures thereof;

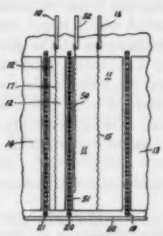
(b) a cathode having a cathode-active material consisting essentially of a chalco-spinel of the formula $M_aN_bZ_x$ wherein M is a divalent ion selected from the group of metals consisting of copper, zinc, cadmium, iron, cobalt, nickel, manganese, molybdenum, vanadium and chromium, N is a trivalent ion selected from the group of metals consisting of iron, cobalt and nickel and metals of Group IVb, Group Vb, and Group VIb of the periodic system, Z is an element selected from the group consisting of sulfur and selenium, a is a numerical value between 0.90 and 1.10, b is a numerical value between 1.80 and 2.20, and x is a numerical value between 3.80 and 4.20; and

(c) an electrolyte which is substantially chemically inert with respect to said anode-active metal and said cathode-active material through which ions may migrate from said anode to said cathode.

4,136,234
CHARGE SENSING ELECTRODE FOR A PRIMARY BATTERY

David H. Fritts, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 844,162, Oct. 21, 1977. This application Apr. 17, 1978, Ser. No. 896,862
Int. Cl.[2] H01M *2/02*
U.S. Cl. 429—178 **3 Claims**



1. An improved cathode electrode for a porous electrode primary battery comprising:

a. a porous carbon cathode electrode, having a first side and an opposite side;

b. a voltage sensing grid positioned in the said porous carbon electrode near the said first side and having a connection tab; and

c. a current collection grid positioned in the said porous carbon electrode near the opposite side of the said electrode.

4,136,235
SECONDARY BATTERIES

Vittorio de Nora, Nassau, The Bahamas; Antonio Nidola, and Placido M. Spaziante, both of Lugano, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 761,315, Jan. 21, 1977, abandoned. This application Jul. 18, 1977, Ser. No. 816,748

Int. Cl.[2] H01M *6/04*

U.S. Cl. 429—204 **10 Claims**

1. A battery comprising a battery housing provided with a cover, positive electrodes with metal bases pasted with particulate oxidized lead and/or lead oxides, negative electrodes with metal bases pasted with lead and/or oxidized lead and an electrolyte, the positive electrode metal bases being selected from the group consisting of tungsten-rhenium alloys, tantalum and titanium-tantalum alloys and the negative electrode metal base being selected from the group consisting of tantalum, titanium-tantalum alloys and tungsten-rhenium alloys coated with a metal selected from the group consisting of lead, cadmium and silver.

4,136,236
LONG-LIFE ALKALINE PRIMARY BATTERY

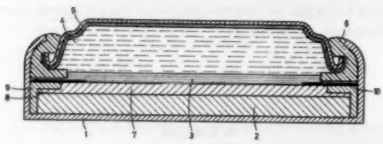
Paul Rüetschi, Yverdon, Switzerland, assignor to Leclanche S.A., Yverdon, Switzerland

Filed Apr. 27, 1977, Ser. No. 791,562

Claims priority, application Switzerland, Apr. 30, 1976, 5477/76

Int. Cl.[2] H01M *6/04*

U.S. Cl. 429—206 **7 Claims**



1. In an alkaline primary battery of the type having a negative electrode containing cadmium or amalgamated zinc and a positive electrode containing monovalent silver oxide, mercuric oxides or mixtures of these oxides with manganese dioxide, the positive electrode having an electrochemically active surface area facing said negative electrode, said primary battery comprising at least one electrically conductive, microporous, electrolyte saturated, optically opaque filter electrode which covers the entire said electrochemically active surface area of said positive electrode, said filter electrode containing electrically conductive material which is not corroded, oxidized nor dissolved in alkali electrolytes at the given potential of said positive electrode and is in electrical contact with said positive electrode, wherein said filter electrode contains, in addition to said conductive material, a very finely divided, surface-rich second substance which is insoluble in alkali electrolytes and is not attacked or dissolved at the potential of said positive electrode.

4,136,237
PROCESS FOR PREPARING CATION-EXCHANGE MEMBRANE BY POLYMERIZING LACTONE RING CONTAINING UNSATURATED MONOMER IN THE PRESENCE OF FLUORINATED POLYMER

Kenji Takahashi; Toru Seita; Shunichi Asami, and Akihiko Shimizu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Aug. 12, 1977, Ser. No. 824,225

Claims priority, application Japan, Sep. 14, 1976, 51/109346

Int. Cl.[2] C25B *13/00*; C08L *31/02*

U.S. Cl. 521—27 **8 Claims**

1. A process for preparing a cation-exchange membrane which comprises swelling a fluorinated polymer membrane having cation-exchangeable groups in a water miscible organic solvent and removing said solvent and then, immersing a monomer having lactone ring and/or a lactonizable monomer with or without a crosslinking agent or a polymerization initiator into the treated membrane.

4,136,238
NON-FLAMMABLE AND OPTIONALLY ELECTRICALLY CONDUCTIVE ORGANO-SILICATE POLYMERS AND PROCESS FOR PREPARING SAME

Karl H. Hilterhaus, Georgsmarien-hutte, Oesede; Franz G. Reuter, Lemforde, and Tankred Menzel, Bad Essen, all of Germany, assignors to Metallgesellschaft A.G.; Reuter Technologie GmbH and Chemie-Anlagenbau Bischofsheim GmbH, all of, Germany

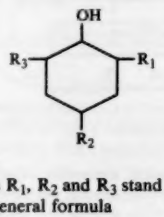
Filed Dec. 4, 1975, Ser. No. 637,674

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2460834; Apr. 24, 1975, 2518192; Jun. 25, 1975, 2528215

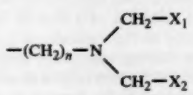
Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—107 **18 Claims**

1. In a process for preparing organosilicate polymers by reaction of a water glass solution with an isocyanate compound having at least two isocyanate groups, the improvement which comprises admixing with the water glass solutions prior to the introduction of said isocyanate compound into the reaction mixture, a zwitterion compound having in the molecule at least one group with positive charge, at least one group with negative charge, and additionally at least one hydrogen atom with Zerewitinov activity, the zwitterion compound being a tertiary amino compound of the general formula



wherein the radicals R_1, R_2 and R_3 stand for hydrogen atoms or a radical of the general formula



wherein n is an integer from 1 to 25 and the radicals X_1 and X_2 are hydrogen atoms and/or alkyl radicals with 1 to 25 carbon atoms, the radicals R_1, R_2 and R_3 may be different, at best two of the radicals R_1, R_2 or R_3 may be hydrogen atoms, and the alkyl radicals may bear primary and/or secondary hydroxyl groups.

10. Process according to claim 1 characterized in that the reaction is carried out in the additional presence of flame retarding agents, especially in the presence of halogenated phosphoric acid esters.

4,136,239
PROCESS FOR PREPARING POLYSILOXANE-POLYOXYALKYLENE MIXED BLOCK POLYMERIZATES

Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt AG, Germany

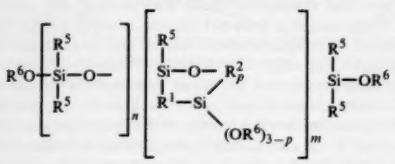
Continuation of Ser. No. 653,242, Jan. 28, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,373

Claims priority, application United Kingdom, Feb. 6, 1975, 5160/75

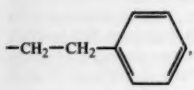
Int. Cl.[2] C08G *18/14*; C08K *5/54*

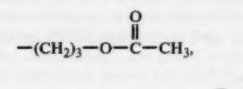
U.S. Cl. 521—111 **3 Claims**

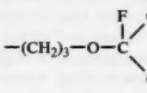
1. In the process for making a polyurethane foam, the improvement comprising use of a foam stabilizing amount of a mixture of polysiloxanepolyoxyalkylene block copolymerizates corresponding to the average formula



wherein R^5 is selected from the group consisting of alkyl-, phenyl-, $-CH_2-Br$, $-(CH_2)_3Cl$,







and $-(CH_2)_3$-O-alkyl groups, R^1 is a bivalent hydrocarbon group with 2 to 8 carbon atoms, R^2 is a trialkylsilyloxy group, or has the meaning of R^5, R^6 is a polyether alcohol group of an average molecular weight of about 400 to 6,000, resulting from the addition of ethylene oxide and propylene oxide to lower alcohols with 1 to 6 carbon atoms and/or corresponding to a lower alcohol, at least two R^6 groups in the average molecule being derived from said polyether alcohol, n is an integer with a value such that the average molecular weight of the siloxane block is about 500 to 12,000, m is an integer from 2 to 30, and p is an integer from 1 to 2.

4,136,240
METALLIC QUATERNARY AMMONIUM CARBOXYLATES AS POLYISOCYANURATE CATALYSTS

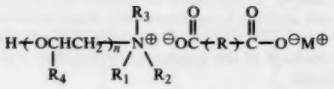
Robert L. Zimmerman, Austin, and Howard P. Klein, Houston, both of Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,209

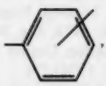
Int. Cl.[2] C08G *18/22, 18/14*

U.S. Cl. 521—115 **15 Claims**

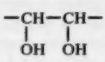
1. In a process for preparing a polymer containing recurring isocyanurate and urethane linkages, which polymer comprises the reaction product of a polyol and an aromatic polyisocyanate, while utilizing an isocyanurate group formation catalyst; the improvement which comprises employing as said isocyanurate catalyst a quaternary ammonium carboxylate alkali metal salt which comprises a compound falling within the following structural formula:



where R_1, R_2 and R_3 individually are radicals selected from the group consisting of alkyl, or substituted alkyl, R_4 is a radical substituted from the group consisting of alkyl, substituted alkyl or hydrogen, R is a radical selected from the group consisting of $-CH_2-_x$,



$-CH_2OCH_2-$, $-CH=CH-$, $-C\equiv C-$, and



and x is a number of from 0 to 20, n is a number of from 1 to 4, and M is an alkali metal cation.

3. The process of claim 1 wherein said polymer is a cellular polymer obtained by reacting said polyol and said polyisocyanate in presence of a blowing agent.

4,136,241
FLEXIBLE POLYURETHANE FOAMS BASED UPON THE USE OF A SOLUBLE AMINE SALT AS CROSSLINKING AGENT

Rudolf Ammann, Thalwil, Switzerland, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 627,489, Oct. 30, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,808

Int. Cl.[2] C08G *18/14, 18/32, 18/34, 18/30*

U.S. Cl. 521—163 **10 Claims**

1. In a process for producing a flexible polyurethane foam, which process comprises reacting in one step a polyether polyol and a crosslinking agent with a polyisocyanate in the presence of a catalyst and a blowing agent, the improvement of employing as at least a major proportion of the crosslinking agent a soluble amine salt obtained by reacting a cycloaliphatic polyamine having at least two primary amine groups with approximately the stoichiometric equivalent amount of a carboxylic acid.

4,136,242
METHOD FOR SUSPENSION-POLYMERIZING VINYL CHLORIDE

Shunichi Koyanagi; Shigenobu Tajima, both of Naoetsu; Kazuhiko Kurimoto, Nakakubiki, and Yoshitaka Kiri, Takada, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Continuation of Ser. No. 135,771, Apr. 20, 1971, abandoned. This application Apr. 18, 1977, Ser. No. 788,256

Claims priority, application Japan, May 4, 1970, 45-38167

The portion of the term of this patent subsequent to Sep. 23, 1993, has been disclaimed.

Int. Cl.[2] C08F *2/20, 114/06*

U.S. Cl. 526—74 **7 Claims**

1. In a method for catalytic suspension-polymerization of vinyl chloride including providing an equeous mixture of vinyl chloride and a suspending or dispersing agent in a polymerization vessel provided with a condenser which communicates with the gaseous phase of the vessel to remove the polymerization heat by the latent heat of the monomer, the improvement which comprises the steps of agitating the aqueous mixture to produce a layer of suspended droplets of vinyl chloride, then

adding a catalyst to said layer to initiate the polymerization reaction, said addition being made only when bubbling caused by the agitation subsides and substantially stable droplets result whereby blockage of the condenser by polymer scale deposition is reduced.

4,136,243

OLEFINE POLYMERISATION PROCESS AND CATALYST

George D. Appleyard, Hitchin; Anthony D. Caunt, Welwyn Garden City; Michael S. Fortuin, St. Albans, and Thomas G. Heggs, Welwyn, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 4, 1974, Ser. No. 529,585

Claims priority, application United Kingdom, Dec. 4, 1973, 56168/73; Mar. 28, 1974, 13741/74

Int. Cl.[2] C08F *4/66, 10/06*

U.S. Cl. 526—139 **9 Claims**

1. An olefine polymerisation catalyst comprising

(a) a solid $TiCl_3$-containing component having a specific surface area of at least 50 metres^2/gm;

(b) at least one organo-metallic compound of aluminum or a non-transition metal of Groups I or IIA; and

c) at least one Lewis Base compound which is an amine, a diamine or an organophosphorus compound,

component a) being the product obtained by reducing $TiCl_4$ with an organo-aluminum compound, separating the reduced solid from the reaction medium, treating the reduced solid with a complexing agent which is an ether of the formula R‴-O-R⁗, where R‴ and R⁗ may be the same or different and are alkyl groups having from 4 to 6 carbon atoms, separating off any excess complexing agent, contacting the treated solid with $TiCl_4$ and isolating the resulting solid $TiCl_3$-containing component.

4,136,244

CONTINUOUS SOLUTION POLYMERIZATION PROCESS

Jean-Maire Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 639,373, Dec. 10, 1975. This application Jan. 27, 1977, Ser. No. 763,113

Claims priority, application France, Dec. 23, 1974, 74 42810

Int. Cl.[2] C08F *4/08, 4/12, 4/48*

U.S. Cl. 526—174 **5 Claims**

1. A process for the continuous solution homopolymerization or copolymerization in a hydrocarbon solvent, initiated by an organolithium initiator, of at least one conjugated diene or of at least one conjugated diene with at least one vinyl aromatic compound in at least one reactor in which the monomers in solution in a hydrocarbon solvent are introduced continuously and from which the solution of homopolymers or copolymers formed and of unreacted monomers is also removed continuously, characterized by the fact that the polymerization reaction is carried out in a reactor of the open type at a temperature of 20° C. to 110° C. and in the presence of a deactivating system which inhibits the formation of gels and which comprises (a) at least one transfer agent which deactivates living macromolecules, said transfer agent being selected from the group consisting of toluene, xylene, diphenylmethane, triphenylmethane, fluorene, indene, cyclopentadiene, dicyclopentadiene, cyclohexadiene-1,4, pentadiene-1,4, vinyl acetylene, propyne, butadiene-1,2, a primary amine, a secondary amine, butyl chloride, butyl bromide and bromobenzene, and (b) at least one metallating agent which increases the reaction velocity of living macromolecules, said metallating agent being selected from the group consisting of the alcoholates of alkali metals other than lithium, the keto metals of alkali metals other than lithium and mixed complexes of an alkali metal and an organoaluminum or organozinc compound, the components of the deactivating system and the initiator being present in amounts such that the ratio of the deactivation velocities of the living macromolecules to the propagation velocity of the polymerization reaction is between 1×10^{-5} and 5×10^{-3}.

4,136,245

CONTINUOUS SOLUTION POLYMERIZATION PROCESS

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jan. 27, 1977, Ser. No. 763,114

Claims priority, application France, Dec. 23, 1974, 74 42810

Int. Cl.[2] C08F *4/08, 4/12, 4/48*

U.S. Cl. 526—174 **4 Claims**

1. A process for the continuous solution homopolymerization or copolymerization in a hydrocarbon solvent, initiated by an organolithium initiator, of at least one conjugated diene or of at least one conjugated diene with at least one vinyl aromatic compound in at least one reactor in which the monomers in solution in a hydrocarbon solvent are introduced continuously and from which the solution of homopolymers or copolymers formed and of unreacted monomers is also removed continuously, characterized by the fact that the polymerization reaction is carried out in a reactor of the open type at a temperature of 20° C. to 110° C. and in the presence of a deactivating system which inhibits the formation of gels and which comprises (a) at least one termination agent which deactivates living macromolecules, said termination agent being selected from the group consisting of a heavy alcohol of the formula $C_nH_{2n+1}OH$ with $N \geqq 4$, the corresponding carboxylic acid, benzyl chloride, benzyl bromide and a phosphoramide; and (b) at least one metallating agent which increases the reaction velocity of living macromolecules, said metallating agent being selected from the group consisting of the alcoholates of alkali metals other than lithium, the keto metals of alkali metals other than lithium and mixed complexes of an alkali metal and an organoaluminum or organozinc compound, the components of the deactivating system and the initiator being present in amounts such that the ratio of the deactivation velocities of the living macromolecules to the propagation velocity of the polymerization reaction is between 1×10^{-5} and 5×10^{-3}.

4,136,246

THERMOPLASTIC ACRYLONITRILE COPOLYMERS

George S. Li, Aurora, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

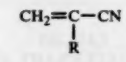
Filed Oct. 29, 1976, Ser. No. 736,889

Int. Cl.[2] C08F *212/34, 220/42, 244/00, 220/48*

U.S. Cl. 526—267 **8 Claims**

1. The polymer resulting from the polymerization of

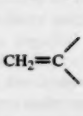
(A) from 50 to 90% by weight of an olefinic nitrile having the structure



wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from 9.5 to 49.5% by weight of at least one member selected from the group consisting of coumarone and indene, and

(C) from 0.5 to 3% by weight of a polyolefinic monomer which contains a plurality of polymerizable



groupings and is selected from the group consisting of divinyl benzene, trivinyl benzene, divinyl naphthalene, triallyl cyanurate, methylene-bis-acrylamide, methylene-bis-methacryla-

mide, triacrylyl triazine, trimethacrylyl triazine, hexaallyl trimethylene trisulfone, tetraallyl methane, tetrabutenyl methane, tetraallyl silane, tetravinyl silane, tetraallyl germane, tetravinyl germane, ethylene glycol diacrylate, pentaerythritol tetra acrylate, allyl acrylate, allyl cinnamate, diallyl maleate, diallyl phthalate, divinyl ether, diallyl ether, 3,9-divinyl-2,4,8,10-tetraoxospiro [5,5] undecane, divinyl ketone and polyalkenyl polyethers of polyhydric alcohols

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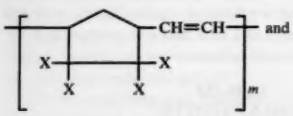
4,136,247

RING-OPENED ISO-PROPYLNORBORNENE COPOLYMERS

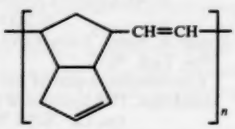
Linwood P. Tenney, Hudson, and Parley C. Lane, Jr., Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 5, 1977, Ser. No. 857,141
Int. Cl.[2] C08F *36/00, 236/00, 2/38, 4/60*
U.S. Cl. 526—283 **5 Claims**

1. A ring-opening polymerized copolymer comprising polymerized units of (a) isopropylnorbornene, (b) dicyclopentadiene in an amount from 0 to about 95 wt.% based upon total copolymer weight, and (c) from about 0.0001 to about 0.5 mole of at least one acyclic monoolefin or nonconjugated acyclic olefin per mole of total isopropylnorbornene and dicyclopentadiene, said acyclic monoolefin or nonconjugated acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atom, said copolymer containing groups primarily of the following types in random order, where m and n are numbers which are proportional to the concentrations of isopropylnorbornene and dicyclopentadiene respectively, one X is isopropyl, and the remaining X's are hydrogen:



and



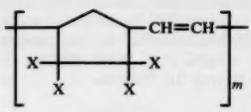
4,136,248

RING-OPENED ALKYLNORBORNENE COPOLYMERS

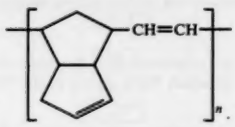
Linwood P. Tenney, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 5, 1977, Ser. No. 857,142
Int. Cl.[2] C08F *236/00, 36/00, 2/38, 4/60*
U.S. Cl. 526—283 **10 Claims**

1. A ring-opening polymerized copolymer comprising polymerized units of (a) at least one alkylnorbornene wherein the alkyl group contains from 8 to 12 carbon atoms, (b) dicyclopentadiene in an amount from 0 to about 95 wt.% based upon total copolymer weight, and (c) from about 0.0001 to about 0.5 mole of at least one acyclic monoolefin or nonconjugated acyclic olefin per mole of total alkylnorbornene and dicyclopentadiene, said acyclic monoolefin or nonconjugated acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atoms, said copolymer containing groups primarily of the following types in random order, where m and n are numbers which are proportional to the concentrations of the alkylnorbornene and dicyclopentadiene respectively, one X is an alkyl group containing from 8 to 12 carbon atoms, and the remaining X's are hydrogen:



and



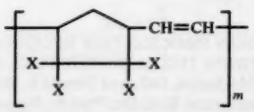
4,136,249

RING-OPENED COPOLYMERS OF DIHYDRODICLOPENTADIENE, NORBORNENE OR ALKYLNORBORNENE, AND ACYCLIC OLEFIN

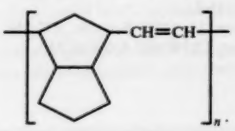
Linwood P. Tenney, Hudson, and Parley C. Lane, Jr., Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 5, 1977, Ser. No. 857,161
Int. Cl.[2] C08F *36/00, 236/00, 4/60, 2/38*
U.S. Cl. 526—283 **13 Claims**

1. A ring-opening polymerized copolymer comprising polymerized units of (a) 1,2-dihydrodicyclopentadiene, (b) from about 5 wt.% to about 95 wt.% of norbornene, at least one alkylnorbornene wherein each alkyl group contains from 1 to 20 carbon atoms, or a mixture thereof, and (c) from about 0.0001 to about 0.5 mole of at least one acyclic monoolefin or nonconjugated acyclic olefin per mole of total norbornene, alkylnorbornene and dicyclopentadiene, said acyclic monoolefin or nonconjugated acyclic olefin containing from 2 to 12 carbon atoms and having at least one hydrogen on each double-bonded carbon atom, said copolymer containing groups primarily of the following types in random order, where m and n are numbers which are proportional to the concentration of the norbornene or alkylnorbornene and the dihydrodicyclopentadiene, respectively, and X is hydrogen or an alkyl group containing from 1 to 20 carbon atoms:



and



4,136,250

POLYSILOXANE HYDROGELS

Karl F. Mueller, and Eduard K. Kleiner, both of New York, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

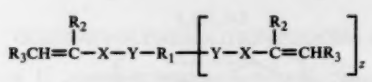
Filed Jul. 20, 1977, Ser. No. 817,405
Int. Cl.[2] C08G *77/04*
U.S. Cl. 528—29 **22 Claims**

1. A water-insoluble hydrophilic gel comprising the cross-linked copolymerization product of

(A) about 20 to about 90% by weight of said gel of (a) a water-soluble monoolefinic monomer, or mixture of said monomers, or (b) a water-soluble monomer, or mixture of said monomers, with 1 to 80% by weight of total mono-

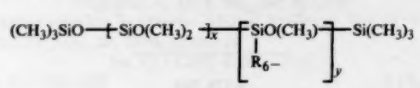
mers of a water-insoluble monoolefinic monomer, or mixture of said water-insoluble monomers, with

(B) about 10 to about 80% by weight of said gel of a terminal polyolefinic hydrophobic siloxane macromer having a molecular weight from about 400 to about 8500, said macromer having the formula

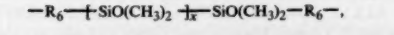


(B)

wherein R_1 is a polysiloxane chain having a molecular weight from about 200 to about 8000, and is of the formula



or



R_2 is hydrogen or methyl,

R_3 is hydrogen or $-COOR_4$,

R_4 is hydrogen or alkyl of 1 to 10 carbon atoms, and with the proviso that at least one of R_2 and R_3 is hydrogen,

X is oxa, —COO— or $-CONR_5-$,

R_5 is hydrogen or alkyl of 1 to 5 carbon atoms,

R_6 is a branched or linear alkylene of 1 to 7 carbon atoms or $-CH_2CH_2O-_n$ where n is 1 to 20,

x is an integer of 3 to 120,

y is an integer of 2 to 3,

z is an integer of 1 to 2,

Y is the direct bond, the diradical $-R_7Z_1-CONH-R_8-NHCO-Z_2-$, or $-R_7OCOCH_2CH_2S-$,

R_7 is a linear or branched alkylene of 2 to 5 carbon atoms connected to X,

R_8 is a diradical obtained by removing the NCO groups from an aliphatic, cycloaliphatic or aromatic diisocyanate,

Z_1 is oxa or $-NR_5-$,

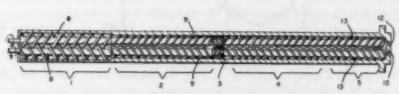
Z_2 is Z_1 or thia and is connected to R_6, with the proviso that if X is oxa, Y is different from a direct bond and R_2 and R_3 are hydrogen.

4,136,251

EXTRUSION PROCESS FOR RECOVERY OF POLYMERS FROM THEIR DISPERSIONS IN LIQUIDS

Archie R. Bice, Hockessin, Del., and Donald K. Burchett, Louisville, Ky., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 12, 1977, Ser. No. 832,354
Int. Cl.[2] C08F *6/22, 6/24*
U.S. Cl. 528—486 **10 Claims**



1. A process for recovering a polymer from a dispersion in a liquid medium comprising introducing the dispersion, and, if the dispersion is a latex which requires a chemical means of coagulation, separately introducing a latex coagulating agent, into a first zone of screw flights of a twin screw extruder having counter-rotating screws and comprising five zones; the flights of both screws in the first zone intermeshing and fully wiping each other as well as the extruder bore; the screw flights in zones **2**, **4**, and **5** being disposed tangentially to each other, a pressure seal between the second zone and the fourth zone constituting the third zone, and a liquid evacuation port being provided in the second zone; if the dispersion is a latex, the latex being coagulated in said first zone of the extruder; the polymer together with the liquid being conveyed by the positive displacement of the screws from said first zone into said second zone, the pressure in said second zone being sufficiently high to allow the polymer to pass through the pressure seal, while the liquid flows back and out through the evacuation port; the polymer in said fourth zone of the extruder being subjected to subatmospheric pressure in order to remove a major portion of liquid still held by the polymer; and the substantially dry polymer being conveyed out of the extruder by the pumping action of the screws.

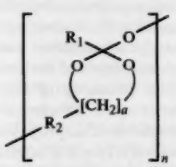
4,136,252

POLYMERIC ORTHOESTERS HAVING ARYLENE ARRANGEMENT

Richard C. Capozza, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 675,185, Apr. 8, 1976, Pat. No. 4,066,747. This application Sep. 28, 1977, Ser. No. 837,308
Int. Cl.[2] C08G *65/00*
U.S. Cl. 528—403 **15 Claims**

1. A polymer of the general formula:



wherein R_1 is a member selected from the group consisting of hydrogen, alkyl, alkenyl, cycloaklyl, cycloalkenyl, aryl, and aralkylene, R_2 is arylene, a is 2 to 3 and n is greater than 10.

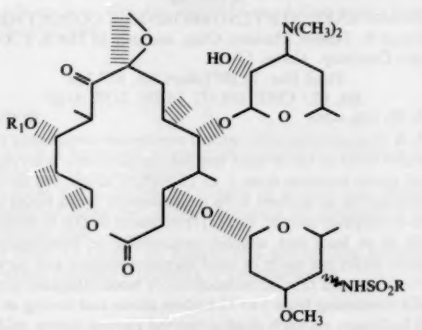
4,136,253

SEMI-SYNTHETIC 4''-SULFONYLAMINO-OLEANDOMYCIN DERIVATIVES

Arthur A. Nagel, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 795,850, May 11, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,608
Int. Cl.[2] A61K *31/71;* C07H *17/08*
U.S. Cl. 536—9 **19 Claims**

1. A compound selected from the group consisting of:



and a pharmaceutically acceptable acid addition salt thereof, wherein R is selected from the group consisting of alkyl having from one to three carbon atoms; 1,1,1-trifluoroethyl; phenyl; monosubstituted phenyl wherein said substituent is selected from the group consisting of fluoro, chloro, bromo, iodo,

hydroxy, methoxy, cyano, carboxamido, nitro, amino, carbomethoxy, carbobenzyloxy, carboxy, trifluoromethyl, alkyl having from one to four carbon atoms and acetamido; disubstituted phenyl wherein said substituents are each selected from the group consisting of chloro, nitro, amino, methoxy and methyl; trichlorophenyl; hydroxy-dichlorophenyl; benzyl; naphthyl; thienyl; chlorothienyl; pyridyl; 2-acetamido-5-thiazolyl; 2-acetamido-4-methyl-5-thiazolyl; 2-benzimidazolyl; dimethyl-2-pyrimidinyl; pyrryl; furyl; substituted thienyl, pyrryl and furyl wherein said substituent is selected from the group consisting of carbomethoxy and alkyl having one to two carbon atoms; and 1-methyl-5-carbomethoxy-3-pyrryl; and R_1 is alkanoyl having from two to three carbon atoms.

4,136,254

PROCESS OF SELECTIVELY BLOCKING AMINO FUNCTIONS IN AMINOGLYCOSIDES USING TRANSITION METAL SALTS AND INTERMEDIATES USED THEREBY

Tattanahalli L. Nagabhushan, Parsippany; William N. Turner, Bloomfield, and Alan Cooper, Parsippany, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 17, 1976, Ser. No. 697,297
Int. Cl.[2] C07H *15/22, 23/00*
U.S. Cl. 536—10 **24 Claims**

1. The process for selectively blocking amino groups with an acyl blocking group, Y, in a polyamino-organic compound, at least one of said amino groups having an available neighboring hydroxyl group, and at least one of said amino groups being either devoid of, or sterically less available to, an available neighboring hydroxyl group;

which comprises the reaction of said polyamino-organic compound in an inert organic solvent, with a salt of a divalent transition metal cation selected from the group consisting of copper (II), nickel (II), cobalt (II) and cadmium (II) or with mixtures thereof, whereby is formed a complex of said polyamino-organic compound between said transition metal salt and said available neighboring amino and hydroxyl group pairs;

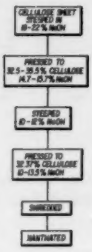
followed by the reaction in situ of the resulting polyamino-organic compound-transition metal salt complex with an amine blocking reagent having an acyl blocking group Y; thence reaction of the resulting polyamino-organic compound-transition metal salt complex having acyl blocking groups, Y, on non-complexed amino groups, with a transition metal precipitating reagent or with ammonium hydroxide, whereby said transition metal cation is removed.

4,136,255

PROCESS FOR MAKING SOLUTIONS OF CELLULOSIC COMPOUNDS

Neal E. Franks, Enka, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Oct. 3, 1977, Ser. No. 838,843
Int. Cl.[2] C08B *9/04, 16/00*
U.S. Cl. 536—60 **8 Claims**



1. A process for making a regenerated cellulosic material which comprises steeping a cellulosic material in an aqueous solution containing from about 18 to about 22% by weight of an alkali metal hydroxide, pressing the resulting cellulosic material containing absorbed alkali metal hydroxide, to remove excess thereof, and steeping the unaged pressed cellulosic material a second time in an aqueous solution containing from about 10 to about 12% by weight of an alkali metal hydroxide, pressing the unaged cellulosic material a second time, shredding and aging said cellulosic material, derivitizing said cellulosic material, and thereafter regenerating the cellulosic material.

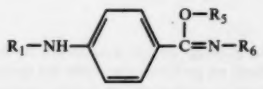
4,136,256

4-(MONOALKYLAMINO)BENZOIC ACID IMIDATES

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 27, 1977, Ser. No. 836,949
Int. Cl.[2] C07D *265/06;* **A61K** *31/535*
U.S. Cl. 544—88 **5 Claims**

1. A compound selected from the group consisting of those of the formula:



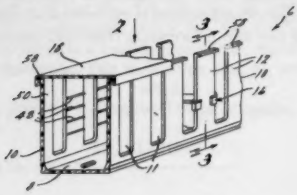
wherein R_1 is an alkyl group of the formula C_nH_{2n+1} wherein n is an integer from 15 to 18, inclusive; R_5 is alkyl having up to 4 carbon atoms; R_6 is alkyl having up to 4 carbon atoms; and R_5 and R_6 taken together is $-(CH_2)_{2-4}$; and the pharmacologically acceptable acid-addition salts thereof.

4,136,257

WIRE DUCT WITH WIRE RETAINING CLIP

Philip W. Taylor, Rte. No. 1, Box 112A, Burnet, Tex. 78611

Filed Mar. 1, 1978, Ser. No. 882,415
Int. Cl.[2] H02G 3/04
U.S. Cl. 174—68 C 11 Claims



1. A wire duct comprising an elongated U-shaped enclosure defined by a bight portion and spaced finger portions extending normally thereto and having first locking means on an inner face thereof, a retaining clip for the retention and positioning of wires within said wire duct, said retaining clip comprising a U-shaped body defined by a bight portion and spaced leg portions extending generally normally thereto with flanges at the ends thereof, the leg portions of the U-shaped body being engageable with a first pair of opposite faces on the finger portions of said duct, the flanges on the leg portions and the bight portion of the U-shaped body being engageable with a second pair of opposite faces on the finger portions of said duct normally related to the first pair of faces, an arm extending generally perpendicularly from the bight portion of said retaining clip and laterally of said duct for retaining and positioning said wires, and second locking means on the bight portion of said retaining clip engageable with said first locking means on the finger portions of said duct to position and retain said retaining clip at a selected spacing relative to the bight portion of said duct.

4,136,258

TRANSITION ENCODING APPARATUS

Harold W. Workman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 11, 1977, Ser. No. 814,607
Int. Cl.[2] H03K 13/00
U.S. Cl. 178—68 9 Claims

1. The method of encoding transitions of isochronous data comprising the steps of:

generating frame pulses to define a period of time designated as a frame;

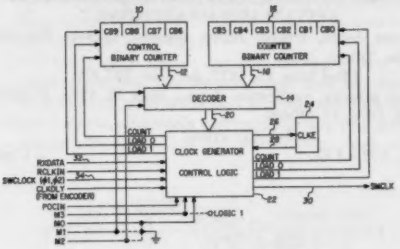
generating data bit sample pulses;

generating a digital number indicative of the time difference, if any, between the occurrence of a frame pulse and the first occurrence of a sample pulse in a frame;

storing a digital indication of the difference obtained;

storing a digital indication of the polarity of the isochronous data at the time of occurrence of the first data bit sample pulse in each frame;

storing a digital indication of the polarity of the isochronous data at the end of each frame; and



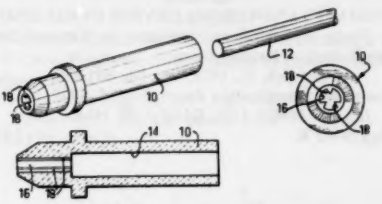
outputting an encoded word indicative of the stored digital indication once for each frame pulse.

4,136,259

IGNITING ELECTRODES AND METHOD FOR MAKING SAME

Jacques L. Djeddah, 4, Avenue Jules Guesde, 92330, Sceaux, France

Filed Oct. 15, 1976, Ser. No. 732,883
Claims priority, application France, Oct. 21, 1975, 75 32120
Int. Cl.[2] H01T 13/34, 13/36; F23Q 3/00
U.S. Cl. 174—152 S 13 Claims



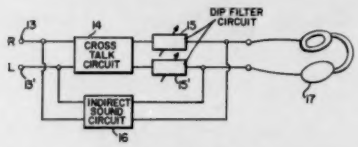
1. A method of manufacturing an igniting electrode for a burner comprising the steps of providing an insulating body of a ceramic material, which body defines a longitudinal bore therethrough and the interior of which is provided over at least part of its length with projections or teeth, providing an electrically conducting metal electrode stem means for supplying an electrical current to generate an igniting spark at an ignition end of the igniting electrode, said electrode stem means having a complementary shape to that of the longitudinal bore, absent said projections or teeth, and forcing said electrically conducting metal stem into the bore of the insulating body so that the projections or teeth make an imprint in the surface of the metal stem as it is being inserted into the bore.

4. An igniting electrode for a burner, comprising an insulating body made from a ceramic material, which defines a longitudinal bore therethrough the interior of which is provided over at least part of its length with projections or teeth and an electrically conducting metal electrode stem means for supplying an electrical current to generate an igniting spark at an ignition end of the igniting electrode, said electrically conducting metal stem being forced into the bore of the insulating body so that the projections or teeth make an imprint in the surface of the metal stem when the latter is forced into said bore.

4,136,260
OUT-OF-HEAD LOCALIZED SOUND REPRODUCTION SYSTEM FOR HEADPHONE

Nobumitsu Asahi, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,770
Claims priority, application Japan, May 20, 1976, 51-58193; Nov. 19, 1976, 51-139699
Int. Cl.[2] H04R 5/04
U.S. Cl. 179—1 G 3 Claims

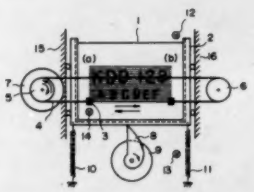


1. In stereo sound reproduction circuitry for use with a stereo signal source and stereo headphones, the improvement of dip filter means disposed between the stereo signal source and the stereo headphones, said dip filter means having a dip in the transmission characteristic thereof, said dip being in substantially the same frequency position as a dip which occurs in the sound pressure frequency response characteristic at the ear canal entrance when a sound source is disposed in front of a listener, means for varying said dip in the transmission characteristic of said dip filter means between said 7 to 13 kHz and means for controlling the magnitude of the dip in the transmission characteristic of said dip filter means between 10–12 dB whereby said last two-mentioned means permit the stereo sound reproduction circuitry to be accommodated to a plurality of different individuals.

4,136,261
AUTOMATIC ANSWERING DEVICE IN FACSIMILE

Tasaku Wada, Tokyo, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Feb. 27, 1978, Ser. No. 881,859
Claims priority, application Japan, Mar. 1, 1977, 52-20901
Int. Cl.[2] H04M 1/56; G11B 5/80; H04N 1/28
U.S. Cl. 179—2 R 2 Claims

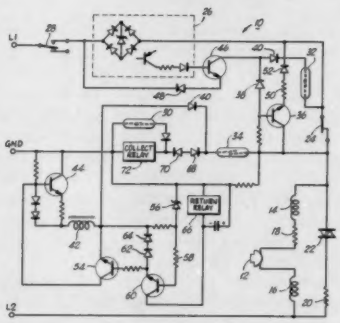


1. An automatic facsimile station answering device, for use with a telephone line, comprising:
- a magnetic record card for storing information identifying the associated station;
- a magnetic head for scanning said magnetic record card to record said information on said magnetic record card and to reproduce the recorded information from said magnetic record card;
- first drive mechanism operatively coupled with said magnetic head for reciprocating the magnetic head along said magnetic record card to perform the main scanning thereof;
- second drive mechanism operatively coupled with said magnetic record card for shifting said magnetic record card by a predetermined width in a direction perpendicular to the direction of said main scanning;
- detection means for detecting a ringing signal on said telephone line; and
- control means connected to said detection means, said first drive mechanism, said second drive mechanism and said magnetic head for actuating said first drive mechanism and said second drive mechanism in response to the detected output of said detection means to send out over said telephone line said information from said magnetic head.

4,136,262
TELEPHONE PAYSTATION

Robert A. Clark, Jr., Ft. Lauderdale, Fla., assignor to Communication Equipment and Engineering Co., Melrose Park, Ill.

Filed Sep. 15, 1977, Ser. No. 833,511
Int. Cl.[2] H04M 17/02
U.S. Cl. 179—6.3 R 11 Claims



1. A full prepay paystation usable in conjunction with a telephone line pair comprising:
- a dialing signal producing device;
- a voice signal transmitter;
- a coin escrow unit having an escrow mode of operation and collect and return modes of operation, said escrow unit including a coin retaining member biased to a first position and operable to a second position upon the deposit of a coin in the escrow unit;
- switching means responsive to the position of said coin retaining member and electrically coupled to said dialing signal producing device and to said voice signal transmitter for applying dialing signals from said dialing signal producing device and voice signals from said voice signal transmitter to said telephone line when said coin retaining member is positioned in said first position and for preventing the application of said dialing signal and said voice signals to said telephone line when said coin retaining member is positioned in said second position; and
- coin counting means electrically coupled to said switching means for rendering said switching means operative to apply signals from said voice signal transmitter and said dialing signal producing means to said telephone line upon the deposit of a predetermined amount of money in said escrow unit when said coin retaining member is in said second position.

4,136,263
TELEPHONE SYSTEM HAVING SPACE DIVIDED SPEECH CHANNELS AND A SEPARATE TIME DIVIDED DATA HIGHWAY

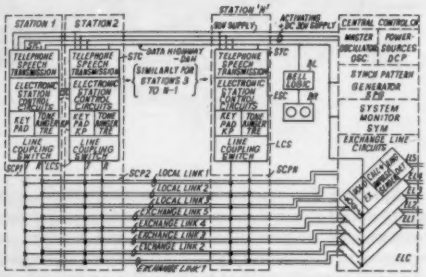
Ioan H. Williams, London, England, assignor to Thorn-Ericsson Telecommunications (Mfg.) Limited, London, England

Continuation of Ser. No. 733,391, Oct. 18, 1976, abandoned, which is a continuation of Ser. No. 566,676, Apr. 8, 1975, abandoned, which is a continuation of Ser. No. 404,656, Oct. 9, 1973, abandoned. This application Jun. 23, 1977, Ser. No. 809,422

Claims priority, application United Kingdom, Oct. 2, 1972, 47160/72

Int. Cl.[2] H04J 3/12

U.S. Cl. 179—15 AT **13 Claims**



12. A telephone intercommunications system comprising

a plurality of service terminals at least some of which are constituted by the telephone stations of the system;

a pluraity of space-divided speech channels, the number of said speech channels being not greater than the number of said service terminals and said speech channels being maintained continuously operative,

means for providing access selectively to all of said speech channels by each of said service terminals;

a data highway, space-divided from the speech channels and coupled to said service terminals to be responsive to data therefrom which identifies calls to be made between service terminals, said data highway being operative in time division multiplex to provide a plurality of discrete data time channels for carrying said call identifying data,

means associating each of said speech channels with one of said discrete data time channels at a respective time position, and

means for selectively controlling said access providing means by the presence of call-identifying data in any one of said data time channels to provide access by the service terminals between which said calls are to be made to the selected one of said speech channels associated with said data time channel.

4,136,264
PRIVATE AUTOMATIC BRANCH EXCHANGE HAVING TWO EXCHANGE UNITS

Mineo Yoshizaki, Yokosuka, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 18, 1977, Ser. No. 788,537

Claims priority, application Japan, Apr. 19, 1976, 51-43731

Int. Cl.[2] H04M 7/00

U.S. Cl. 179—18 AD **11 Claims**

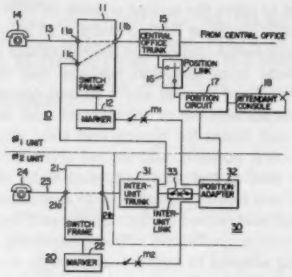
1. A PABX system comprising:

a first exchange unit including a first switch frame having a plurality of terminal positions, a first marker for controlling said first switch frame to establish a connection path between any two of said terminal positions, and a central office trunk connected to one of said terminal positions;

a second exchange unit including a second switch frame having a plurality of terminal positions, a second marker for controlling said second switch frame to establish a connection path between any two of said terminal positions, and an extension telephone set connected to one of said terminal positions;

an interunit trunk connecting another one of said terminal positions of said first switch frame with another one of said terminal position of said second switch frame; and

control means selectively connected to said first and second markers for connecting said central office trunk which has



received a call from a central office to said extension telephone set of said second exchange unit, including first means for sending information identifying said interunit trunk to said first marker to establish a first connection path between said central office trunk and said interunit trunk and second means for sending along a path separate from said first connection path information identifying the extension telephone set number to said second marker to establish a second connection path between said interunit trunk and said extension telephone set.

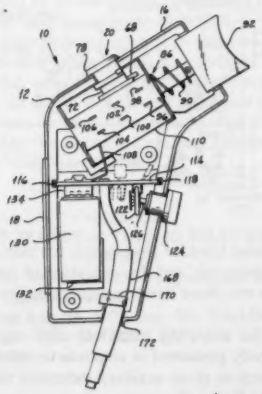
4,136,265
HAND-HELD MICROPHONE ASSEMBLY

Paul L. Cote, Windham, N.H., assignor to Gentex Corporation, Carbondale, Pa.

Filed Aug. 24, 1977, Ser. No. 827,219

Int. Cl.[2] H04M 1/04

U.S. Cl. 179—146 R **15 Claims**



1. A hand-held microphone assembly including in combination a generally elongated prehensible casing; a microphone; means mounting said microphone on said casing; an amplifier in said casing; means coupling said microphone to said amplifier; a battery in said casing adapted to act as a power source for said amplifier; an output line and a control line running outwardly from said casing; a double-pole slide switch assem-

bly mounted in the direction of the length of said casing, said switch assembly comprising first and second transversely spaced switches each including a first fixed contact and a second contact movable between a first position out of engagement with the first contact and a second position in engagement with the first contact, said switch assembly including a movable slider element mounting the movable contacts of said switches for movement as a unit and means for biasing the second contact of each of said switches to said first position; manually operable means on said housing for moving said slider element to move the second contact of each of said first and second switches from its first position to its second position; and a third switch disposed at the end of said slide switch assembly remote from said first position, said third switch including a first fixed contact and a second contact movable between a first position out of engagement with its associated first contact and means for biasing said third switch second contact to its first position, said second contact of said third switch being so disposed relative to said slider element that movement of said element in response to said manually operable means urges said second contact against said first contact of said third switch in conductive contact therewith, one of said switches being adapted to connect said battery to said amplifier, another of said switches adapted to connect said amplifier to said output line, another of said switches being connected in said control line.

4,136,266

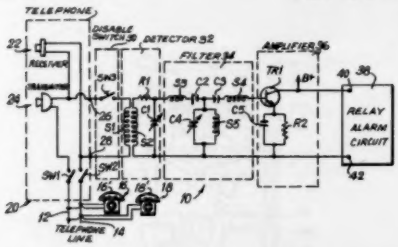
TELEPHONE INTRUDER ALERT SYSTEM

Eric S. Cohen, 230 Crestwood Dr., South Orange, N.J. 07079, and Paul Korwin, 150-09-77 Ave., Flushing, N.Y. 11367

Filed Feb. 21, 1978, Ser. No. 879,476

Int. Cl.[2] H04M *1/68*

U.S. Cl. 179—81 E **9 Claims**



1. A telephone intruder alert system for indicating the subsequent interconnection and disconnection of an extension telephone with a telephone line to a current on-line user, comprising:

a. means for detecting electrical click signals which are respectively generated in response to interconnection and disconnection of an auxiliary extension telephone with a telephone line; and

b. means responsive to the detection of the electrical click signals for indicating to a current on-line user of a primary extension telephone which is already interconnected with the telephone line of the subsequent interconnection and disconnection of the auxiliary extension telephone,

whereby the on-line user is alerted to the presence of an intruder on the telephone line.

4,136,267

TRANSMISSION SYSTEMS

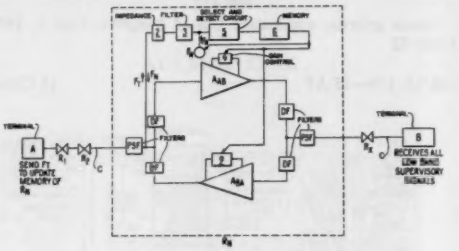
Basil B. Foster, and Ian J. Hirst, both of London, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,590

Claims priority, application United Kingdom, Apr. 6, 1976, 13863/76

Int. Cl.[2] H04B *3/12, 3/38*

U.S. Cl. 179—170 A **9 Claims**



1. Apparatus for remote control of cable repeaters, comprising within said repeater: means for detecting a control signal of predetermined frequency received by said repeater, means responsive to said control signal for translating said signal into a d.c. state-control signal, a bistable storage device having a first and a second output, said device responsive to said d.c. state-control signal for changing state to emit a condition changing signal on one of its outputs, a first circuit component of said repeater responsive to the change of state of said storage device for varying a predetermined parameter of said circuit in accordance with the output emitting the condition changing signal.

4,136,268

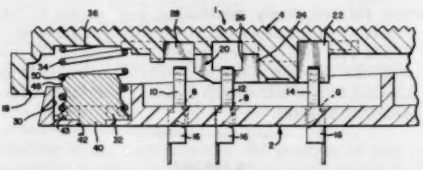
PUSH TO TALK SWITCH

William H. Rose, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 30, 1977, Ser. No. 856,073

Int. Cl.[2] H01H *3/00, 23/24*

U.S. Cl. 200—17 R **3 Claims**



1. In a switch having a lever pivoted in opposition a coiled resilient return spring, a base carrying a pair of switch poles, and a bridging contact moved by sufficient pivoting of said lever to engage said poles and establish electrical connection therewith, the improvement comprising:

means anchoring said return spring to said base,

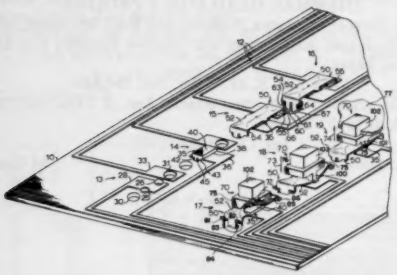
means for engaging a coil of said spring thereby detaining compression of at least a portion of said spring until said sufficient pivoting of said lever has occurred to resiliently compress a remainder of said coil spring to cause sudden slidable traverse of said coil over said last mentioned means, said sudden traverse providing an audible click and a tactile feel of said sufficient pivoting of said lever, and

a stop engaged by said lever to prevent excessive pivoting thereof.

4,136,269
SPRING SWITCH FOR MOUNTING ON A CIRCUIT BOARD SUBSTRATE

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 491,425, Jul. 24, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,811
Int. Cl.[2] H01H 5/18
U.S. Cl. 200—67 D 3 Claims

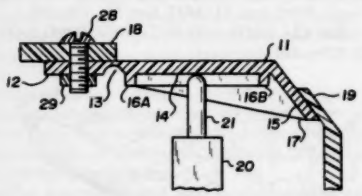


1. A switch contact comprising:
a single piece of spring metal formed into a "U" shaped configuration having a top portion and support and staking legs perpendicular therewith for insertion into holes in a substrate;
each of said legs configured to securely engage at a predetermined depth of insertion, the edges of the substrate hole into which it is inserted to secure said switch to said substrate with said top portion above and generally parallel with said substrate;
said top portion constructed to have a stable state and a non-stable state and to respond to a force applied thereon in the direction of said substrate to deform from said stable state into said non-stable state in the direction of the substrate and upon removal of said force, to spring back to its stable state.

4,136,270
ACTUATOR FOR PUSHBUTTON SWITCH

William F. Wernet, Huntsville, and Raymond H. Anders, Madison, both of Ala., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 24, 1977, Ser. No. 780,888
Int. Cl.[2] H01H 3/12, 13/14
U.S. Cl. 200—340 9 Claims

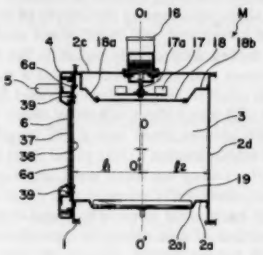


1. Actuator means for use with at least one pushbutton switch internally mounted within an associated enclosure, comprising a unitary structure constructed of plastic material and including:
a mounting section rigidly fastened to said enclosure,
an operating section flush to the exterior of said enclosure adjacent to and in contact with said pushbutton switch;
and a hinge section connecting said operating section to said mounting section;
whereby said pushbutton switch is arranged to apply a force to said operating section retaining said operating section in a non-operated position and in response to the application of manual pressure to said operating section, said operating section is displaced to an operated position, to render said pushbutton switch operated.

4,136,271
MICROWAVE OVEN

Junzo Tanaka, Fujiidera, and Chikao Urashima, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 27, 1977, Ser. No. 763,120
Claims priority, application Japan, Feb. 4, 1976, 51-11541; Feb. 3, 1976, 51-11536[U]; Feb. 5, 1976, 51-12656[U]
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 F 2 Claims

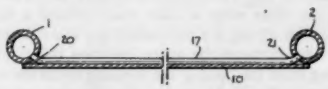


1. A high frequency microwave oven which comprises an oven defining structure, walls within said oven defining structure defining a heating cavity for accomodating therein an object to be heated and having an access opening at one lateral side of the heating cavity, door means having an observation window therein and an electric wave shielding member and transparent plate members on opposite sides thereof forming the inner and outer surfaces of said door means and mounted on said oven defining structure, said door means selectively opening and closing said access opening, means in said oven defining structure for supplying high frequency energy into said heating cavity, and rotary table means rotatably disposed within said heating cavity for carrying the object to be heated thereon and being rotatable about a rotational center thereof, said rotational center of said rotary table being offset toward the rear wall of said heating cavity which is diametrically opposite said access opening relative to said rotational center, the distance of such offset being a portion of the distance between the inner surface of said door and the rear wall of the heating cavity, the distance from said rotational center of said rotary table means to the inner surface of said door means being greater than the distance from said rotational center to the rear wall of said heating cavity.

4,136,272
METHOD OF MANUFACTURING HEAT EXCHANGE PANELS

Wallace C. Rudd, New Canaan, Conn., assignor to Thermatool Corporation, Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,335
Int. Cl.[2] B23K 11/02
U.S. Cl. 219—107 10 Claims



1. A method for making a heat exchange panel comprising a plurality of sub-panels each comprising a finite length of a

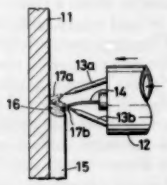
metal tube secured by welding to metal sheet material except at opposite end portions thereof which are small relative to said finite length, said method comprising continuously advancing both metal tubing and a metal sheet in separated relation to a weld point, said sheet having a face which is narrow relative to its length and which is wider than the thickness of said sheet, pressing said tubing and said face of said metal sheet together at said weld point and continuously removing said tubing and said metal sheet from said weld point, said tubing and said metal sheet having corresponding longitudinally continuous lengths at least several times said finite length of said tubing, supplying high frequency current to said tubing and said metal sheet upstream of said weld point to cause the facing surfaces thereof to reach welding temperature by the time that they reach the weld point thereby forming a longitudinally continuous weld between said tubing and said metal sheet during the time that said high frequency current is supplied to said tubing and said metal sheet, interrupting the supply of high frequency current to said tubing and said metal sheet each time that a length of said tubing substantially equal to but less than said finite length passes said weld point so that a portion of said tubing which is small in length relative to said finite length is not welded to said metal sheet, whereby there is provided a unit of a length several times said finite length and which comprises said tubing welded to said metal sheet along most of the length of the tubing but with weld interruptions spaced apart a distance substantially equal to said finite length, severing said unit at each weld interruption and intermediate the ends of said portion of said tubing to provide several of said sub-panels each having tubing thereon of said finite length welded to said metal sheet except at the end portions of said last-mentioned tubing, and assembling a plurality of said sub-panels in side-by-side relation to form said heat exchange panel.

4,136,273

METHOD AND APPARATUS FOR TIG WELDING

Haruo Eujita; Yasushi Ishikawa; Hiroshi Tachikawa, and Taizo Nakamura, Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,652
Int. Cl.[2] B23K *9/04, 9/24*
U.S. Cl. 219—121 P **7 Claims**



1. A method of TIG welding in which a plurality of spaced nonconsumable electrodes extending from the head of a welding torch are placed in a protective atmosphere formed by inert shielding gas emitted from the head of the welding torch which can travel along a weld line of base metal, and a filler wire is also fed into the protective atmosphere to carry out welding of the base metal, which method comprises:

projecting the plurality of nonconsumable electrodes from the head of the welding torch toward the weld line;

passing the filler wire at least once around a ring-shaped passage for giving it a permanent set, and then passing the filler wire through the space between the electrodes extending from the head of the welding torch for feeding the filler wire, the filler wire bending toward one of the electrodes due to the permanent set;

supplying welding voltage and current independently to the respective electrodes;

producing a single molten pool by melting the base metal and filler wire with arcs generated between each electrode and the base metal, and;

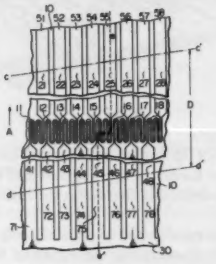
controlling weld penetration and fusion of the base metal chiefly with arc plasma from one of the nonconsumable electrodes and melting the filler wire chiefly with arc plasma from the remaining electrodes.

4,136,274

THERMAL HEAD FOR A PRINTER

Susumu Shibata; Tsutomu Nomoto, and Keiji Murasugi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,848
Claims priority, application Japan, Apr. 5, 1976, 51-37229; Aug. 30, 1976, 51-102586
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **14 Claims**



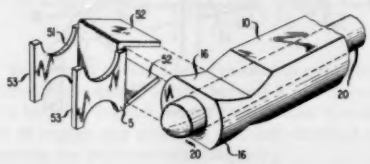
1. A thermal head for a printer comprising a dielectric plane support, a plurality of first conductive layers of a single material mounted parallel to one another on said support, each of said layers being electrically insulated from one another, each of said conductive layers having a unitary structure including a pair of straight lead lines and a heater line formed in a zigzag fashion between said lead lines, said lead lines and said heater line being integral and continuous, a second conductive layer plated on part of said lead lines, the conductivity of the material of said second conductive layer being better than that of said first conductive layer, wherein the material of said first conductive layer is nickel.

4,136,275

ELECTRICALLY HEATED ANCHOR INSERTION TOOL

Harold E. McCullough, Blacklick, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 11, 1977, Ser. No. 758,469
Int. Cl.[2] H05B *1/00;* B27F *7/02;* B29D *3/00*
U.S. Cl. 219—230 **7 Claims**



1. Apparatus for use with heating means to heat and install an insert into thermoplastic material comprising

means adapted to receive a heating means and formed into a tip externally shaped for internally grasping and heating an insert by conductively transferring heat from the heating means to the insert;

means slidably disposed in said grasping and conductively heating means for engaging the grasped insert; and

means positioned in said grasping and conductively heating means for biasing said engaging means into engagement

with the grasped insert to maintain the insert in engagement with said shaped tip during heating and insertion of the insert into the thermoplastic material.

4,136,276

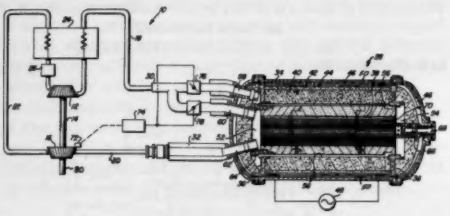
HEAT STORAGE METHOD AND APPARATUS

Thomas L. Ashe, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 650,822, Jan. 20, 1976, Pat. No. 4,089,176. This application Feb. 28, 1977, Ser. No. 773,094

Int. Cl.[2] H05B *5/02*; F24H *7/04*

U.S. Cl. 219—378 **18 Claims**



1. Noncombustion heat storage apparatus for heating a working fluid to a substantially constant temperature, comprising:

a casing having inlet means for receiving relatively cool working fluid, and outlet means for exhausting the working fluid at said constant temperature;

a foraminated graphite core located generally centrally within said casing;

means in said casing for heating said core by electromagnetic induction to a temperature substantially above said constant temperature;

thermal insulation means in said casing substantially surrounding said core and cooperating therewith to define a fluid mixing chamber and a separate fluid plenum chamber, said core having a plurality of internal through passages communicating with both said plenum chamber and said mixing chamber;

means in said casing defining first and second fluid passages extending from said inlet means to said mixing chamber and said plenum chamber respectively, whereby a portion of the working fluid flows through said first passage to reach said mixing chamber at a temperature below said constant temperature, while the remainder of working fluid flows through said second passage to said plenum chamber and then through said internal passages in heat exchange relationship with said core to reach said mixing chamber at a temperature above said constant temperature;

means in said casing defining a third fluid passage extending from said mixing chamber to said outlet means whereby the working fluid is exhausted at a temperature dependent upon the ratio of working fluid flowing through said first and second passages; and

means for controlling said ratio to maintain the exhausted working fluid at said constant temperature.

4,136,277

EXPOSURE CONTROL SYSTEM FOR A DOCUMENT COPYING MACHINE

James A. Gerrard, Hanslope, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1976, Ser. No. 753,325

Claims priority, application United Kingdom, Dec. 30, 1975, 53119/75

Int. Cl.[2] G01J *1/32*; G03B *7/08, 27/74*

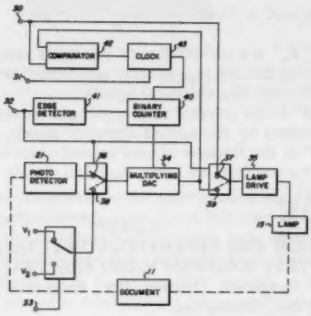
U.S. Cl. 250—205 **1 Claim**

1. An automatic exposure system for a document copying machine which includes a scanning optical system having an imaging period and a calibrating period, said scanning optical system comprising:

a lamp illumination control loop for providing a calibrated control signal, said control loop comprising means for supplying a reference control signal for use in controlling illumination during the calibration period;

a light intensity detector positioned to receive light reflected during the calibration period from a document to be copied;

a multiplying digital to analogue convertor arranged to respond to the output of said light intensity detector;



and counter means for providing a digitized down count output;

a comparator for comparing the output of said digital to analogue convertor and the reference control signal and for controlling the countdown of said counter means to equalize the output of said convertor and the reference control signal, and circuit means for maintaining the output of said counter means constant during a subsequent imaging period and for supplying a predetermined input to said digital to analogue convertor to generate as its output said calibrated control signal.

4,136,278

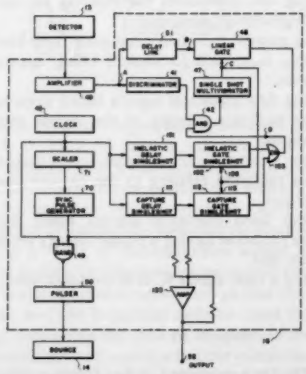
METHOD AND APPARATUS FOR PULSED NEUTRON SPECTRAL ANALYSIS USING SPECTRAL STRIPPING

Donald W. Oliver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 14, 1977, Ser. No. 815,640

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—269 **13 Claims**



1. A method of well logging, comprising the steps of:

irradiating the formations surrounding an earth borehole with high energy neutrons;
detecting radiations emanating from said formations resulting from said formations being irradiated by said neutrons;
generating first electrical signals based upon said detected radiations relating to the carbon content of said formations;
generating second electrical signals based upon said detected radiations relating to the oxygen content of said formations; and
generating a ratio signal R_c in accordance with the relationship

$$R_c = (C - fO/O),$$

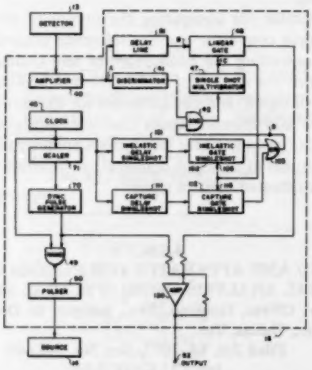
where "R_c" is a corrected carbon/oxygen ratio,
"C" is the carbon content of said formations as determined by said first electrical signals,
"O" is the oxygen content of said formations as determined by said second electrical signals, and
"f" is the fraction of said second electrical signals subtracted from said first electrical signals.

4,136,279

METHOD AND APPARATUS FOR PULSED NEUTRON SPECTRAL ANALYSIS USING SPECTRAL STRIPPING

Eric C. Hopkinson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 14, 1977, Ser. No. 815,489
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 **8 Claims**



1. A method of well logging, comprising the steps of:
irradiating the formations surrounding an earth borehole with high energy neutrons;
detecting gamma radiation emanating from said formations resulting from said formations being irradiated by said neutrons;
generating first electrical signals based upon said detected gamma radiation relating to the carbon content of said formations;
generating second electrical signals based upon said detected gamma radiation relating to the oxygen content of said formations;
generating third electrical signals based upon detected gamma radiation having a higher energy level than that of oxygen; and
generating a ratio signal R_c in accordance with the relationship

$$R_c = (C - H)/(O - H)$$

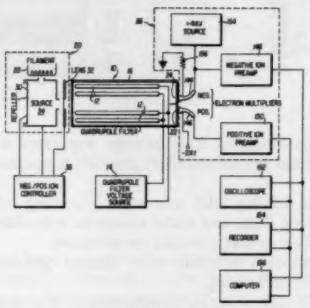
where "R_c" is a corrected carbon/oxygen ratio,
"C" is the carbon content of said formations as determined by said first electrical signals,
"O" is the oxygen content of said formations as determined by said second electrical signals, and
"H" is functionally related to at least a portion of said third electrical signals.

4,136,280

POSITIVE AND NEGATIVE ION RECORDING SYSTEM FOR MASS SPECTROMETER

Donald F. Hunt, and George C. Stafford, Jr., both of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Continuation-in-part of Ser. No. 650,783, Jan. 20, 1976, Pat. No. 4,066,894. This application May 9, 1977, Ser. No. 795,148
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.[2] B01D *59/44*; H01J *39/40*
U.S. Cl. 250—292 **12 Claims**



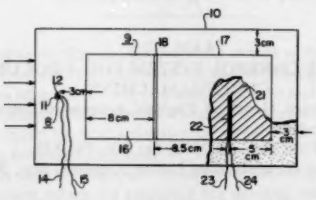
1. A method of generating and monitoring positive and negative ions substantially simultaneously using a quadrupole mass spectrometer having an ion generator with repeller, source and lens electrodes, and a quadrupole filter, comprising the steps of:
operating the mass spectrometer under conditions favoring the generation of positive and negative ions;
alternately transmitting the positive ions and the negative ions at a frequency in excess of 0.1 Hz through the quadrupole filter; and
separately extracting the alternately transmitted positive ions and negative ions at the output of the quadrupole filter.

4,136,281

ENERGY FLUENCE METER FOR X-RAYS

Kenneth M. Murray, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1977, Ser. No. 841,515
Int. Cl.[2] G01T *1/16*
U.S. Cl. 250—336 **20 Claims**



1. In a portable X-ray detector system for determining energy fluence of an X-ray field comprising:

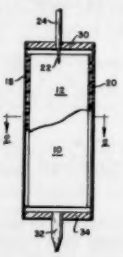
a first assembly,
said first assembly made of a material for absorbing incident X-radiation totally only for the low-energy part of the spectrum;
first detector means embedded within said first assembly at its center for producing an output signal proportional to X-radiation energy deposited in said first assembly by incident primary X-radiation;
a second assembly;
second detector means embedded within said second assembly on a longitudinal axis for producing an output signal proportional to X-radiation energy deposited in said second assembly by incident primary X-radiation;
said second assembly made of materials which modify the X-radiation spectrum as it penetrates said materials to said second detector means such that said second detector means responds only to a portion of incident X-radiation greater than said low energy part; and
a thermal insulating housing,
said first and second assemblies embedded within said thermal insulating housing, said first assembly being positioned relative to said second assembly to receive incident X-radiation prior its receipt by said second assembly.

4,136,282

DIRECTIONAL DETECTOR OF GAMMA RAYS

Samson A. Cox, Downers Grove, and Francis E. Levert, Chicago, both of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 29, 1977, Ser. No. 855,637
Int. Cl.[2] G01J *1/00;* G01T *1/22;* G01J *1/42*
U.S. Cl. 250—336 **3 Claims**



1. A directional detector of gamma rays comprising a first strip of an electrical conductor of high atomic number, a second strip of an electrical conductor of a low atomic number disposed parallel to the first strip and bonded thereto in physical and electrical contact therewith, an electrode coaxial with the first and second strips, means for maintaining a vacuum inside the detector, means for completing an electrical circuit between the conducting strips and the electrode, and means for measuring the electric current in the circuit.

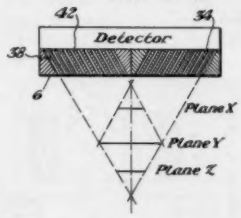
4,136,283

TOMOGRAPHIC APPARATUS AND METHOD

Alvin S. Blum, 2350 Del Mar Place, Fort Lauderdale, Fla. 33301

Continuation of Ser. No. 380,203, Jul. 18, 1973, abandoned, and a continuation of Ser. No. 650,321, Jan. 19, 1976, abandoned.
This application Nov. 25, 1977, Ser. No. 854,896
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S **3 Claims**

1. A tomographic visualization device comprising:
a data processor means for providing accumulated information,
a scintillation camera connected to said data processor for providing image data of radiation from a body to said data processor means, said camera including a detector connected to said data processor and a stationary collimator connected to said detector,
said stationary collimator for collecting data from said body to provide tomographic data including,
at least two sections each including a large number of channels, said channels in each section having longitudinal center lines generally parallel to each other; and all said channels of at least two sections of said collimator having



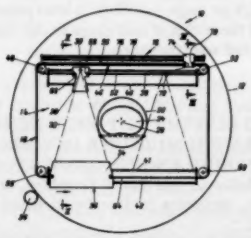
longitudinal center lines at the same general angle in relation to a single reference plane for at least two sections of said collimator; said longitudinal center lines of the channels in each section intersect the longitudinal center lines of the channels of at least one other section at a large number of planes to reinforce the image at different distances from said stationary collimator,
said camera and said body fixed in relation to one another during radiation image data collection.

4,136,284

APPARATUS FOR EXAMINING A BODY BY MEANS OF PENETRATING RADIATION

Raphael Blumental, Kiriat Tivon, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Jun. 16, 1977, Ser. No. 807,175
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **11 Claims**



1. In apparatus for examining a body by means of penetrating radiation such as X- or γ- rays, a radiation beam assembly comprising a member with a radiaton source for producing a collimated beam of penetrating radiation, a member with detector means for receiving radiation from the source, and guide means for slidably mounting the members on a support structure containing a circle of reconstruction within which the body is located so that the members are on opposite sides of the center of the circle of reconstruction and so that the members are translatable as a unit in parallel paths to cause the beam to sweep through and define the plane of the circle of reconstruction, the improvement comprising a flexible connection linking the members for maintaining a fixed spatial relationship therebetween during their translation at least while the beam sweeps through the circle of reconstruction.

4,136,285
METHOD FOR IRRADIATING A SPECIMEN BY CORPUSCULAR-BEAM RADIATION

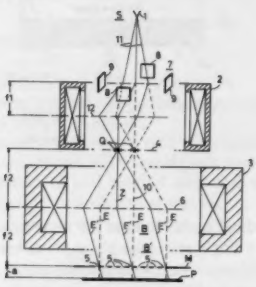
Klaus Anger; Burkhard Lischke; Andreas Oelmann, and Helmut Reschke, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 15, 1976, Ser. No. 732,645

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2547079

Int. Cl.[2] H01J *37/00*

U.S. Cl. 250—492 A **1 Claim**



1. In a method for irradiating a specimen by corpuscular beam radiation in a surface pattern having areas unexposed to said beam surrounded at least almost completely by areas exposed to said beam and in which a mask having a pattern corresponding to the surface pattern to be generated and a support grid comprising a plurality of parallel strips which support areas of said mask corresponding to said unexposed areas of said surface pattern are uniformly illuminated by said beam, and in which an image of said mask is optically shifted at least approximately perpendicular to said strips of said support grid by a distance which is at least equal to the width of said strips, the improvement comprising the steps of,

illuminating said mask by a corpuscular-ray beam consisting of a plurality of parallel corpuscular rays,

imaging said mask on said specimen by means of shadow projection, and

tilting said corpuscular-ray beam in a direction perpendicular to the longitudinal axis of said strips of said support grid through an angle which is at least equal in radians to the ratio of the width of said strips to the distance between said mask and said specimen.

4,136,286
ISOLATED ELECTRICAL POWER GENERATION SYSTEM WITH MULTIPLE ISOCHRONOUS, LOAD-SHARING ENGINE-GENERATOR UNITS

William J. O'Halloran, and James Trombley, Jr., both of Fort Collins, Colo., assignors to Woodward Governor Company, Rockford, Ill.

Filed Jul. 5, 1977, Ser. No. 812,995

Int. Cl.[2] H02J *3/46*; H02P *9/04*

U.S. Cl. 307—57 **5 Claims**

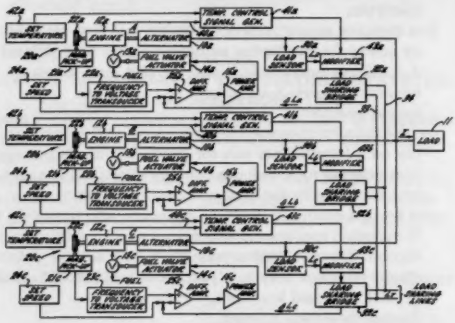
1. In an isolated electrical power generation system having multiple isochronous, load-sharing engine-generator units including

(1) load sensing means for generating a signal representing the individual power output of each engine-generator unit,

(2) means for generating a signal representing the total power output of all the engine-generator units in said system, and

(3) load-sharing means responsive to deviations between each individual power output signal and said total power output signal for controlling the fuel inputs to the respective engines in said units,

the improvement comprising load simulating means responsive to the occurrence of a preselected condition in an individual unit for adding a simulated power output signal to the individual power output signal for the unit to reduce the fuel input to



that unit without reducing said total power output signal, thereby avoiding a reduction in the fuel inputs to the other units and a resultant reduction in the frequency of the power output of the system.

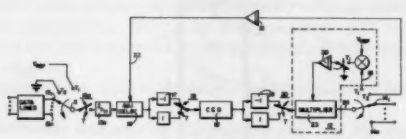
4,136,287
INPUT PHASE MODULATION CORRECTION FOR CHARGE-TRANSFER-DEVICE ANALOG SHIFT REGISTERS

Gerald W. Kephart, Lakewood, and Stanley A. White, Yorba Linda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 17, 1976, Ser. No. 751,633

Int. Cl.[2] G11C *19/28*

U.S. Cl. 307—221 D **9 Claims**



1. A device for the correction of signal tail distortion occurring in an analog sampling shift register and comprising synchronous phase inverter means in series circuit cooperation with adjustable input time phase modulation means having a modulation control input responsive to a synchronous phase inverted output of said shift register during the response thereof to an applied null input to compensate for tail-end data smear of signal samples sampled by said shift register.

4,136,288
FREQUENCY TRANSLATION CIRCUITS

Michel Knapp-Ziller, and Loic Pasquer, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed May 9, 1977, Ser. No. 795,142

Claims priority, application France, May 11, 1976, 76 14036; Oct. 20, 1976, 76 31564

Int. Cl.[2] H03K *17/68*

U.S. Cl. 307—240 **6 Claims**

1. A frequency translation circuit comprising:

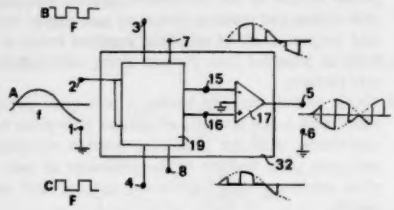
a dc supply having input and output terminals;

a control signal generator, having input and output terminals, for delivering two square waves 180° out of phase;

means for connecting a carrier wave to a parallel connection of the input terminals of said supply and generator;

a switching circuit including a C-MOS double bi-directional switch having a pair of output terminals for delivering the translated signal and first, second and third pairs of input

terminals connected respectively to the signal to be frequency translated, to the output terminals of said control



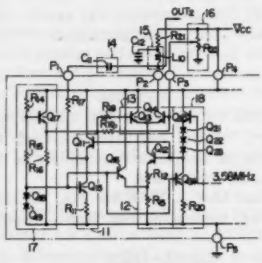
signal generator and to the output terminals of said dc supply.

4,136,289

PHASE CONTROL CIRCUIT AND OSCILLATOR CIRCUIT USING IT

Makoto Furihata, Kokubunji; Shigeaki Minamihata, Fuchu, and Takao Yokoyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 23, 1977, Ser. No. 771,200
Claims priority, application Japan, Feb. 25, 1976, 51-19009
Int. Cl.[2] H03K *1/12, 5/13*
U.S. Cl. 307—262 **6 Claims**



1. A phase control circuit comprising a controlled voltage source circuit and a controlled current source circuit, an input signal at a reference frequency to the phase control circuit being applicable in common to said source circuits, first and second impedors, one end of said first impedor being connected with one end of said second impedor, and an output control circuit interconnected between said controlled current source circuit and the connected ends of said first and second impedors and arranged to receive a control signal for controlling the phase of the output of the phase control circuit in response to said control signal, the other end of said first impedor being connected with said controlled voltage source circuit and the other end of said second impedor being AC-wise grounded.

4,136,290

JOSEPHSON SELF GATING AND CIRCUIT AND LATCH CIRCUIT

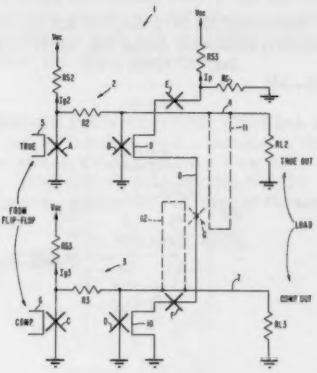
Arthur Davidson, Yorktown Heights, and Dennis J. Herrell, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1977, Ser. No. 855,858
Int. Cl.[2] H03K *3/38, 19/195*
U.S. Cl. 307—277 **32 Claims**

1. A self gating circuit comprising:

a latching circuit which includes at least a pair of devices capable of carrying Josephson current which provide via output interconnection lines connected to said pair of devices true and complement outputs in response to true and complement inputs,

a source of pulsed power of given pulse duration connected to said latching circuit, and,



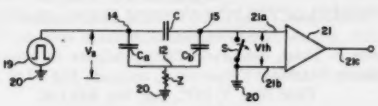
means for maintaining the outputs obtained in response to said true and complement inputs for said given pulse duration despite a change in said inputs within said given pulse duration.

4,136,291

CAPACITIVE TOUCH-PAD DEVICES WITH DYNAMIC BIAS

Wesley K. Waldron, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 23, 1977, Ser. No. 799,345
Int. Cl.[2] H03K *3/26, 5/153;* **H01G** *5/04*
U.S. Cl. 307—308 **11 Claims**



1. A capacitive touch pad device comprising:

a substrate of dielectric material having first and second opposed surfaces;

a single conductive touch electrode responsive to human communication fabricated upon said first surface over a preselected continuous area;

a pair of spatially separated electrodes fabricated upon said second surface substantially within an area overlying and bounded by the area of said touch electrode;

at least one of said pair of electrodes having at least one extension therefrom extending parallel to and spaced from at least one surface of the remaining one of said pair of electrodes; and

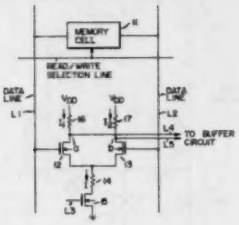
dielectric material filling the volume defined between said electrode extension and the confronting portion of said remaining electrode to provide a first electrical capacitance therebetween of essentially constant value;

the dielectric material of said substrate separating said conductive touch electrode and each of said spatially separated electrodes providing second and third electrical capacitances respectively therebetween of essentially constant value.

4,136,292
VOLTAGE SENSING CIRCUIT OF DIFFERENTIAL INPUT TYPE

Yasoji Suzuki, Ayase, and Kiyofumi Ochii, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1977, Ser. No. 827,721
Claims priority, application Japan, Sep. 30, 1976, 51-117547
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—355 **9 Claims**



1. A voltage sensing circuit for sensing data read out of a memory cell through first and second complementary data lines coupled to said memory cell, comprising:

first and second MOS transistors of one channel type each having drain, source and gate electrodes, said gate electrodes of said first and second transistor being connected to said first and second data lines, respectively;

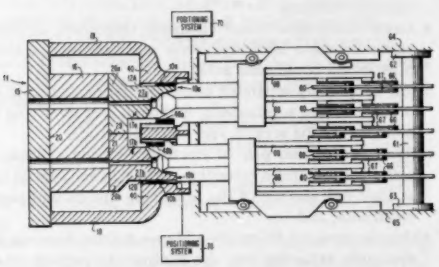
first and second load resistive impedance means for coupling said drain electrodes of said first and second transistors, respectively, to one terminal of a DC power supply source; and

a third constant current source MOS transistor of said one channel type for coupling said source electrodes of said first and second transistors to the other terminal of said DC power supply source, said third transistor being rendered ON in response to application of a control signal to a gate electrode thereof to cause said voltage sensing circuit to sense data on said first and second data lines.

4,136,293
MULTI-ACTUATOR SYSTEM USING SINGLE MAGNETIC CIRCUIT

Tulsidas R. Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,134
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **15 Claims**



1. A multiple coil linear actuator comprising in combination

a low reluctance backing plate,

a single permanent magnet having two opposite planar surfaces one of which is attached to said backing plate

a plurality of pole pieces each of which comprises a base portion and having one planar surface in contact with said magnet and at least one side surface adapted to contact a corresponding side surface of an adjacent pole piece, and a cylindrical pole portion integral with said base portion,

each of said base portions being attached to the said other planar surface of said permanent magnet with the axis of said cylindrical portion normal to said planar surfaces of said magnet, each of said base portions being in contact with an adjacent base portion along said corresponding side surface,

A single unitary housing having a pole plate portion provided with a like plurality of annular pole piece receiving aperatures, with the remaining portion extending from said pole plate portion to the perimeter of said backing plate enclosing said permanent magnet and said pole pieces,

means removably attaching said housing to said backing plate so as to position each said pole piece in one of said annular pole piece receiving apertures to thereby define a plurality of annular flux gaps each of which is in a separate parallel magnetic circuit with said permanent magnet whereby the same substantially uniform flux distribution is obtained throughout said gaps, and

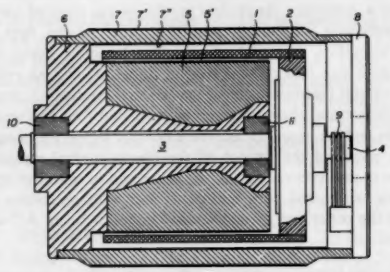
and a cylindrical coil member disposed in each of said gaps, the axial length of said coil being less than the axial length of the annual gap to maintain said coil completely with said gap during movement,

each said coil adapted to be independently energized to cause movement thereof within its annular gap without effecting either the position or movement of any other coil relative to its annular gap.

4,136,294
DIRECT-CURRENT MICROMOTOR

François Aubert, Boudry, and Marc Heyraud, Les Geneveys, Coffrane, both of Switzerland, assignors to Portescap, La Chaux-de-Fonds, Switzerland

Filed Mar. 1, 1977, Ser. No. 773,328
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608889
Int. Cl.[2] H02K *13/14*
U.S. Cl. 310—220 **6 Claims**

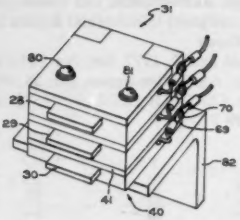


1. Direct-current micromotor comprising a rotor bearing a motor winding, a segmented commutator and brush arrangement for supplying currents to said winding, said rotor being arranged for rotation between a core part and a mantle part of a stator structure, one of the said parts of the stator comprising a permanent magnet and the other part being at least in part made of magnetically conductive material, wherein at least a part of the surfaces of at least one of the core part and the mantle part of the stator structure facing the rotor winding is provided with an electrically conductive layer the thickness of which is more than 10 μ m and the specific electrical resistance is less than 0.09 ohm.mm^2.m^{-1}.

4,136,295
AIRCRAFT BRUSH MODULE

David B. Sweet, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 24, 1977, Ser. No. 771,707
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—239 16 Claims

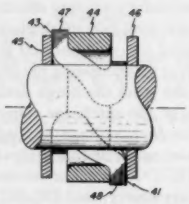


1. A brush assembly for establishing electrical connection from a brush assembly to a rotating slip ring comprising a pair of flat members made of dielectric material; one of said members having a recess to provide an opening therein; a brush slidably mounted in said recess; spring means located in said recess for biasing said brush outwardly out of recess to project a portion of said brush through said opening; a passageway in said one member extending into said one member for communicating with said recess; a wire secured to said brush member and extending through said passageway outwardly of said brush assembly; means interconnecting said flat members to retain said members in abutting relationship; said one flat member has a forward portion and a rear portion; said recess being located in said forward portion and extending into said rear portion; a slot in said rear portion communicating with said recess; said brush having a rod secured thereto for linear movement therewith; and said rod guided by said slot for projection out of said one flat member indicating the wear of said brush.

4,136,296
HIGH-SPEED, LAMINATED ROTOR FOR HOMOPOLAR INDUCTOR ALTERNATOR

John S. Hickey, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 15, 1977, Ser. No. 806,599
Int. Cl.[2] H02K *1/24*
U.S. Cl. 310—269 4 Claims



1. A rotor for a high-speed inductor alternator having two sets of salient poles, respectively, at longitudinally-separated regions of the rotor, respectively, the poles of one set being offset circumferentially by a predetermined angle from the poles of the other set comprising:

a plurality of nested laminations, each of said laminations extending continuously from the face of one pole through a mid-region extending generally parallel to an axis of rotation of the rotor and which rotates with said poles around said axis during operation of said alternator in one of said regions to the face of an opposite pole in the other of said regions;

said plurality of laminations constituting a low reluctance path interconnecting each of said poles in one of said regions to each of said poles in the other of said regions;

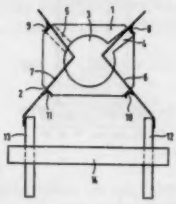
nonmagnetic restraining means constraining said nested laminations within a fixed radial distance from the rotor longitudinal axis; and

an end clamp situated at each longitudinal end, respectively, of said nested laminations, each of said end clamps being configured to abut substantially the entire longitudinally-outer surface at each end, respectively, of the radially-innermost one of said laminations.

4,136,297
FOUR CORNER PIEZOELECTRIC CRYSTAL SUPPORT

Wolfgang Briese, Berlin, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,716
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1976, 2651094
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—353 7 Claims



1. A piezoelectric crystal holder for a rectangular crystal vibrator coated on both sides with electrodes comprising:

said crystal having all corners bevelled;

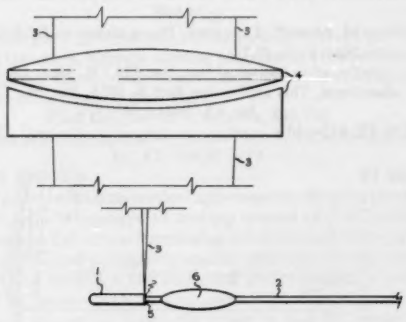
two angled-off spring sheetmetal members each having slots therein to support said corners; and

flaps bent out of the ends of each of said slots to engage said bevelled corners to hold said crystal in said slots.

4,136,298
ELECTRODE-INLEAD FOR MINIATURE DISCHARGE LAMPS

Richard L. Hansler, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 824,557, Aug. 15, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,612
Int. Cl.[2] H01J *61/06*
U.S. Cl. 313—217 11 Claims

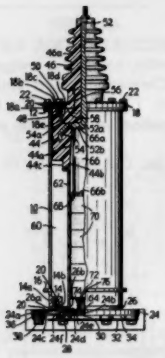


8. An electrode-inlead assembly comprising an electrode having a pin-like root end of tungsten joined on axis to a fine refractory metal wire inlead having means adapting it to make a seal through a fused silica part, the join being effected by a laser weld.

4,136,299
LIGHTNING ARRESTER DEVICE

Nobuo Nagai, Nishinomiya; Tugio Watanabe, Akoh, and Shoji Tada, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 26, 1976, Ser. No. 680,368
Int. Cl.[2] H01J *17/00, 21/00*
U.S. Cl. 313—325 42 Claims

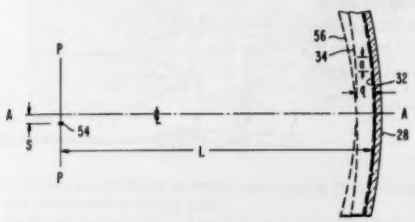


1. A lightning arrester device comprising, in combination, a metallic housing, an arrester element disposed within said metallic housing and including a discharge gap device, an electrically insulative block disposed on the incoming-line side of said metallic housing and shaped to encircle the incoming-line side of said discharge gap device including at least a portion of the lateral surface of the incoming-line side of said discharge gap device while leaving a space between said metallic housing and said arrester element to encircle the ground side of said arrester element, terminal means on the incoming-line side extending through and sealed in said electrically insulative block for connecting with the incoming-line side of said arrester element, and means for forming a hermetic seal between said electric insulation block and said metallic housing, said space defining an electrically insulating space in which said arrester element is disposed and said insulative block portion having a dielectric constant greater than that of said space to reduce in use an electric field density on said discharge gap device.

4,136,300
CATHODE RAY TUBE HAVING IMPROVED SHADOW MASK

Albert M. Morrell, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 559,778, Mar. 19, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,592
Int. Cl.[2] H01J *29/07*
U.S. Cl. 313—403 12 Claims



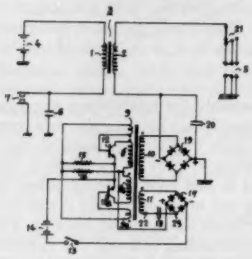
1. In a cathode-ray tube of the vertical line screen, slit apertured mask type, the improvement comprising,

the ratio of mask-to-screen spacing at the edge of the screen on the horizontal central axis to the mask-to-screen spacing at the center of the screen being in the range of 1.15 to 3.0.

4,136,301
SPARK PLUG IGNITER COMPRISING A DC-DC CONVERTER

Hirokazu Shimojo, Akatsukashin, and Toshio Inamura, Tokyo, both of Japan, assignors to Kabushiki Kaisha Sigma Electronics Planning, Japan

Filed Jan. 7, 1977, Ser. No. 757,516
Claims priority, application Japan, Jul. 26, 1976, 51/88276
Int. Cl.[2] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 T 5 Claims



1. A spark plug igniter circuit, comprising:

an ignition coil having a primary winding and a secondary winding;

a spark discharge device connected to said secondary winding of said ignition coil for developing a discharge current therethrough and developing an electrical spark in response to a high voltage induced across said secondary winding;

a direct-current power source connected to said primary winding of said ignition coil for affecting current flow through said primary winding;

a breaker point, connected in series with said primary winding and said direct-current power source, and operative in a closed position for allowing direct current to flow through said primary winding and operative in an open position for interrupting the current flow through said primary winding to thereby induce the high voltage across said secondary winding effective for developing an electrical spark with said spark discharge device; and

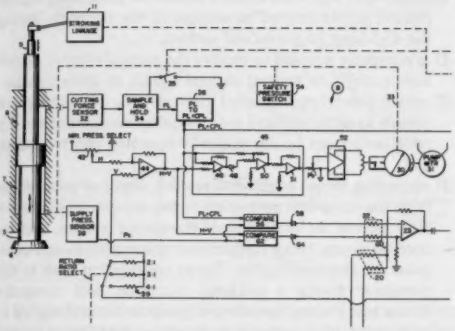
DC-DC converter means connected in series with said secondary winding for increasing the discharge current flowing through the spark discharge device and for extending the duration of the discharge current developed in response to the high voltage applied by said secondary winding to said spark discharge device;

wherein said DC-DC converter means comprises an auxiliary DC power source, said DC-DC converter including an input connected to said auxiliary DC power source and an output connected in series with said secondary winding and having a transformer for effecting a change between the input and the output voltage of the DC-DC converter, a feedback winding coupled with the transformer of said DC-DC converter for developing a voltage in response to current flowing through said transformer, rectifying means for rectifying the voltage induced in said feedback winding, a reactor connected in series between said feedback winding and said rectifying means, and means for connecting the output of said rectifying means in series with said auxiliary DC power source and with the same polarity to thereby vary the input voltage to said DC-DC converter according to the current flowing through said transformer of said DC-DC converter.

4,136,302
CONTROL SYSTEM FOR MACHINE TOOL WITH HYDRAULICALLY STROKED CUTTER

Erich Tlaker, and Clarence M. Nichols, both of Springfield, Vt., assignors to Fellows Corporation, Springfield, Vt.

Filed Jan. 10, 1977, Ser. No. 758,321
Int. Cl.² G05B 19/24
U.S. Cl. 318—39 22 Claims

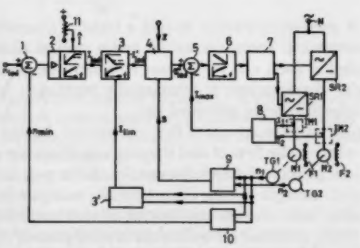


1. The combination in a machine tool of a reciprocable cutter spindle having a stroke cycle including a cutting stroke and a return stroke, a stroking motor, a hydro-mechanical means driven by said stroking motor for reciprocating said spindle at a stroking speed (stroke cycles per minute) directly related to the speed of said stroking motor, means providing a first electrical signal representing a fundamental stroking speed, means providing a second electrical signal representing a stroking speed corresponding to a predetermined maximum return stroke velocity of said spindle, means providing a difference signal representing the difference between said first and second signals, a signal summing circuit, motor control means connected with the output of said summing circuit and with said stroking motor for driving said stroking motor at a speed directly related to said output of said summing circuit, said summing circuit having two inputs, means continuously supplying to one of said inputs said first electrical signal, and means for supplying to the other of said summing circuit inputs at least a fraction of said difference signal during only the return strokes of said spindle.

4,136,303
TORQUE LIMITING DRIVE WITH SLIP MONITOR

Hans Almquist; Lars-Olof Nilsson, and Hans Skoog, all of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Jul. 5, 1977, Ser. No. 813,049
Claims priority, application Sweden, Jul. 15, 1976, 7608070
Int. Cl.² H02P 5/52
U.S. Cl. 318—52 8 Claims



1. In a motor driven vehicle including drive wheels and at least one drive motor coupled thereto, a torque controlling device for controlling the drive torque of said drive motor and slip indicating means for providing a slip signal when said drive wheels are subjected to slipping wherein the improvement comprises:

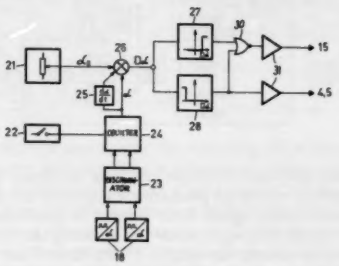
means responsive to successive occurences of said slip signal for comparing elapsed time between successive slip signals with a predetermined time, and

torque adjusting means for reducing available drive torque of said motor when said elapsed time is less than said predetermined time.

4,136,304
CONTROL DEVICE FOR A BRAKING MECHANISM USING AN ENERGY-STORING SPRING

Urs Baechler, Effretikon, and Pierre Riondel, Genf, both of Switzerland, assignors to Brown, Boveri & Co. Ltd., Baden, Switzerland

Filed May 18, 1976, Ser. No. 688,095
Claims priority, application Switzerland, May 30, 1975, 6985/75
Int. Cl.² H02K 7/10
U.S. Cl. 318—372 14 Claims



1. In a control system for a braking mechanism of the type wherein the braking mechanism employs an energy-storing spring, an electric rotatable servomotor and a translationally movable spindle rod, the improvement comprising:

means for measuring a parameter related to the stored braking force of said braking mechanism and wherein the servomotor includes a rotor and said stored braking force parameter measuring means includes means for determining the angular position of the servomotor rotor.

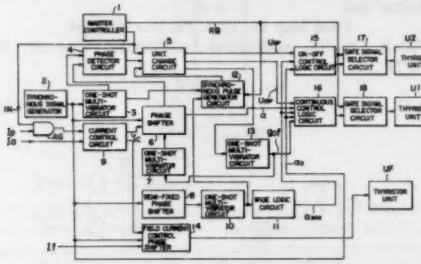
4,136,305
POWER CONVERTER CONTROL APPARATUS

Yoshio Okumura, Katsuta; Genichi Matsumoto, Hitachi; Kyozo Tachibana, Ibaraki, and Yoshio Nozaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 26, 1977, Ser. No. 845,723
Claims priority, application Japan, Nov. 4, 1976, 51/131784
Int. Cl.² H02P 3/14
U.S. Cl. 318—376 6 Claims

1. A power converter control apparatus for effecting powering control and regenerative braking control of a DC motor, comprising a DC motor functioning as a series motor for powering control and a separately-excited generator for regenerative braking control, a first converter unit connected in series to said DC motor in DC fashion and continuously controlling an output thereof for supplying power to said DC motor, a second converter unit connected in series between said first converter unit and said DC motor and effecting on-off control of said output, a third converter unit for controlling a field current of said DC motor only for regenerative braking control, a current control circuit for receiving a current command and an armature current, said current control circuit controlling the armature current in response to said current command, a first phase shifter for supplying a conduction phase signal to

said first converter unit in response to an output from said current control circuit, a second phase shifter for receiving an output from said current control circuit and the field current, said second phase shifter producing a conduction phase signal for controlling the field current, a master controller for generating a command for instructing the number of said first and second converter units to be rendered operative and powering and regenerative braking control, a unit change circuit for applying a unit changing operation signal to said first and second converter units in response to the command for instructing the number of converter units to be rendered operative generated from said master controller and an output from said first phase shifter, a gate cut-off circuit for receiving an output of said unit change circuit, said gate cut-off circuit cutting off the application of the output of said first phase shifter to said first converter unit for a predetermined length of



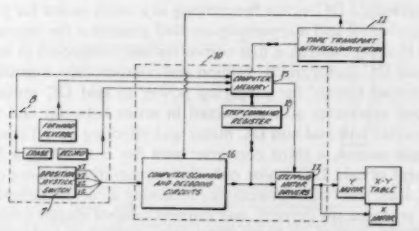
time, said gate cut-off circuit restoring the phase of said first phase shifter, means for producing a minimum and a maximum conduction phase signals from a signal in synchronism with a power supply, first logic means for receiving the output of said unit change circuit, the output of said first phase shifter, the output of said gate cut-off circuit, said maximum and minimum conduction phase signals, said first logic means for logically producing a gate signal to be applied to said first converter unit, in response to powering and regenerative braking control commands from said master controller, and second logic means for receiving the output of said unit change circuit and the minimum and maximum conduction phase signals, said second logic means logically producing a gate signal to be applied to said second conduction unit, in response to powering and regenerative braking control commands from said master controller.

4,136,306

APPARATUS FOR PREPARING PATTERN CONTROL TAPES

Kenneth P. Westlund, Danvers, and Patrick N. Kirwan, Beverly, both of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 610,774, Sep. 5, 1975, abandoned. This application Jul. 13, 1977, Ser. No. 815,369
Int. Cl.[2] G05B *19/42*
U.S. Cl. 318—568 **2 Claims**



1. A sewing machine for digitizing a predetermined pattern and thereafter stitching the predetermined pattern on a workpiece, said sewing machine comprising:

A. an x-y table for supporting a model of the predetermined pattern during a digitizing operation and for supporting a workpiece during the stitching operation;

B. an optical viewing system mounted above said x-y table for projecting the model pattern on a viewing screen so as to enable an operator to view the model pattern;

C. a manually-operated control means for generating signals relative to the desired movement of the x-y table during the digitizing of the model pattern;

D. a computer adapted to receive the manual control signals and convert the manual control signals to drive signals;

E. motor drive means adapted to receive the computer drive signals so as to perform the desired movement of the x-y table as dictated by the manually-operated control means; and

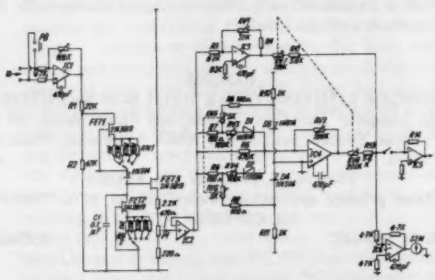
F. recording means adapted to receive digitized information from the computer pertaining to the movement of the x-y table during the digitizing of the model pattern, said recording means being furthermore responsive to said computer for transmitting the digital information back to the computer during a stitching operation, said computer furthermore being operative to generate control signals to said motor drive means so as to subsequently cause the x-y table to be driven by said motor drive means during a stitching operation.

4,136,307

AMPLIFIER ARRANGEMENT FOR PROCESS CONTROLLER

Brian J. Scott, Saffron Walden, United Kingdom, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,615
Int. Cl.[2] G05I *1/00*
U.S. Cl. 318—677 **4 Claims**



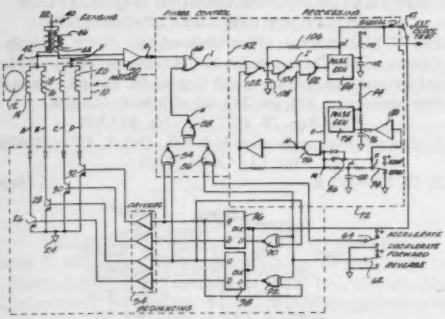
1. A process controller having a transfer characteristic that is symmetrical about the origin and a central plateau region bounded at each end by regions in which the gradient of the transfer characteristic is substantially increased, said transfer characteristic being provided by:

a parallel arrangement of first and second shaping amplifiers, wherein the first of said shaping amplifiers has a relatively low gain providing substantially all the gain in the central plateau region of the characteristic, said gain being adjustable, and wherein the second of said amplifiers is effectively switched off within the central plateau region of the transfer characteristic and has a relatively high adjustable gain outside that region, the switching threshold being determined by adjustable potential dividers.

4,136,308
STEPPING MOTOR CONTROL

Kenyon M. King, 7520 Cerrito Roja, Cucamonga, Calif. 91730

Filed Aug. 29, 1977, Ser. No. 828,541
Int. Cl.[2] G05B 19/40
U.S. Cl. 318—696 14 Claims

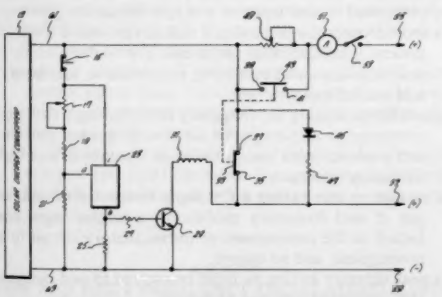


1. A commutation circuit for a brushless DC motor of a type having a permanent magnet rotor and four stator windings energized by switching the windings in sequence across a DC power source, the commutation circuit comprising a transformer having a first winding connected in series with two of the stator windings and the power source and having a second winding connected in series with the other two stator windings and the power source, means comparing the voltages across the two windings for generating an output pulse when the two voltages are equal, and means for switching the stator windings in response to the output pulses of said comparing means.

4,136,309
POWER OUTPUT CONTROL CIRCUIT FOR SOLAR-POWERED CATHODIC PROTECTION SYSTEM

Robert L. Galberth, 12452 Gilbert, Garden Grove, Calif. 92641; Roy L. Arnold, 16262 Wishingwell La., Huntington Beach, Calif. 92647, and John C. Bollinger, 9181 Heatherton Cir., Huntington Beach, Calif. 92646

Filed Jul. 1, 1977, Ser. No. 812,149
Int. Cl.[2] H02J 7/00; H01B 7/28
U.S. Cl. 320—2 8 Claims



1. A power output control system for a solar-powered cathodic protection system wherein a current is constantly supplied to a metal structure located in an electrolyte material, said system comprising:

a solar energy converter connected to said metal structure;

a battery connected to said solar energy converter to be charged thereby and connected to said metal structure;

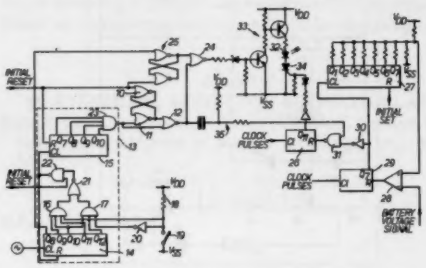
means for sensing the charge level on said battery when said battery is connected to said metal structure and for sensing the voltage output of said solar energy converter when said battery is disconnected from said metal structure; and

means responsive to said sensing means indicating a predetermined charge level on said battery for disconnecting said battery from said metal structure and reducing the charging current to said battery.

4,136,310
AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

George W. Foster, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Mar. 14, 1977, Ser. No. 777,462
Claims priority, application United Kingdom, Mar. 17, 1976, 10604/76
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—37 10 Claims



1. Apparatus for supervising the switching off of an electric battery charger and providing a topping-up charge, comprising a clock programmer giving digital signals on an output thereof for long periods and short periods alternately, a bistable latch having set and reset inputs, of which the set input is connected to the programmer output to force the latch into its set condition during the said short periods, an initial reset signal source, the reset input is connected to the initial reset signal source, a gate connected to be controlled by the programmer output and by the latch for controlling the switching on and off of charging current, the gate switching on the charging current when either the latch is in its reset condition or the programmer is providing a set signal to the latch, so that the said charging current is allowed to be switched on, because the latch is reset; during a first long period at the end of which the latch is set, without switching off the charging current until the end of the ensuing short period, and at the end of each subsequent long period the charging current is switched on again, and at the end of each subsequent short period the charging current is switched off again.

4,136,311
DUAL RATE VOLTAGE REGULATOR

Ralph E. Scheidler, 7415 SE. Johnson Creek Blvd., Portland, Oreg. 97206

Filed May 19, 1977, Ser. No. 798,640
Int. Cl.[2] H02J 7/14
U.S. Cl. 322—28 7 Claims

1. A dual rate voltage regulator for a direct current alternator or generator having a field coil terminal and positive and negative output terminals for connection across a battery, the regulator comprising:

(a) positive, negative and field coil terminals arranged for connection to corresponding terminals of a direct current alternator or generator,

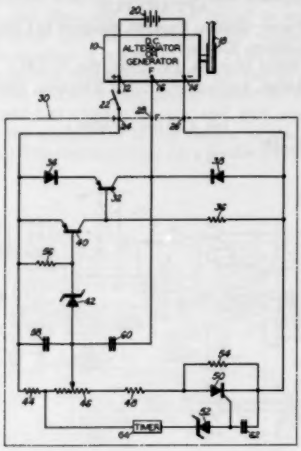
(b) first electrically actuated switch means for connecting said field coil terminal to one of said positive and negative terminals,

(c) first electric switch actuator means arranged to be connected across said positive and negative terminals for operation at a predetermined low level output voltage from a direct current alternator or generator to open said

first switch means, whereby to limit the output charging voltage to said low level,

(d) second electrically actuated switch means arranged to releasably connect said first electric switch actuator means across said positive and negative terminals, and

(e) second electric switch actuator means connected across said positive and negative terminals and operable at a



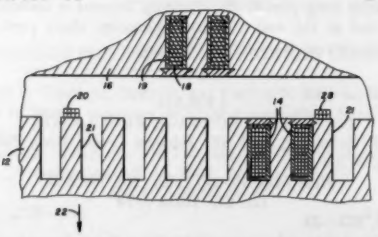
predetermined higher level output voltage from the direct current alternator or generator to close said second switch means and connect said first switch actuator means across said terminals, whereby to operate the first switch actuator means to open said first switch means and reduce the direct current voltage output of the alternator or generator from said higher level to said low level.

4,136,312

METHOD AND APPARATUS FOR DETECTION OF ROTOR FAULTS IN DYNAMOELECTRIC MACHINES

Sheppard J. Salon, Pittsburgh, and Lon W. Montgomery, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 755,773
Int. Cl.² G01R *31/02, 33/02*
U.S. Cl. 324—51 **3 Claims**



1. A synchronous dynamoelectric machine comprising:

a generally tubular shaped stator with a plurality of alternating slots and teeth around said stator's inner periphery;

a cylindrical rotor member carrying a distributed field winding, said rotor member being mounted within said tubular shaped stator and separated therefrom by an air gap, whereby when said rotor rotates a field flux wave is generated in said air gap;

two search coils disposed in said air gap, said search coils being mounted on said teeth of said tubular shaped stator at locations spaced an odd multiple of 180 electrical degrees apart, said coils being linked by the radial component of said field flux wave in said air gap; and

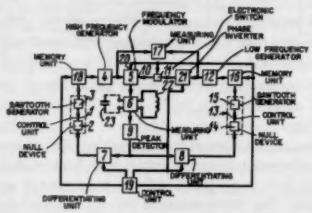
means coupled to the search coils for detecting the presence of even harmonics in said field flux wave by comparing the voltages induced in said search coils to provide an indication of a fault in the rotor winding of said dynamoelectric machine.

4,136,313

APPARATUS FOR MEASURING Q-QUALITY OF OSCILLATORY CIRCUIT COMPONENTS

Viktor V. Molochnikov, ulitsa Olshevskogo, 11, kv. 7; Vasily I. Efimov, ulitsa Zhudro, 4, kv. 116; Anatoly S. Veraxo, 3 Mozhaisky pereulok, 53, kv. 1, and Evgeny M. Savitsky, prospekt Rokossovskogo, 156, kv. 242, all of Minsk, U.S.S.R.

Filed Sep. 29, 1977, Ser. No. 837,849
Claims priority, application U.S.S.R., Oct. 1, 1976, 2408263
Int. Cl.² G01R *27/00*
U.S. Cl. 324—57 R **2 Claims**



1. An apparatus for measuring Q-quality of oscillatory circuit components comprising:

a first control unit having a null device and a sawtooth generator connected in series;

a first memory unit having two inputs and an output,

said sawtooth generator of said first control unit being connected to said first input of said first memory unit;

a high-frequency generator having an input connected to said output of said first memory unit;

a frequency modulator having three inputs and an output a first input of said frequency modulator being connected to said high-frequency generator;

an electronic switch having two inputs and an output connected to a second input of said frequency modulator;

a low-frequency generator having an input and an output electrically coupled to said first input of said electronic switch;

a second memory unit having two inputs and an output connected to said input of said low-frequency generator;

a second control unit having a null device and a sawtooth generator connected in series, said sawtooth generator of said second control unit being connected to said input of said second memory unit;

a unit for measuring the frequency ratio, having a first input connected to said output of said low-frequency generator and a second input connected to said output of said high-frequency generator;

a measuring unit having a first input connected to said output of said frequency modulator, a second input connected to the components of the oscillatory circuit to be investigated, and an output;

a peak detector having an input connected to said output of said measuring unit and an output;

a unit for producing the first frequency derivative of the amplitude-frequency response of the oscillatory circuit, said unit having an output connected to said null device of said first control unit, and two inputs;

a unit for producing the second frequency derivative of the amplitude-frequency response of the oscillatory circuit, said unit having an output connected to said null device of said second control unit, and two inputs;

a third control unit having a plurality of outputs a first output of which is connected to said first input of said unit for producing the first frequency derivative of the ampli-

tude-frequency response of the oscillatory circuit, a second output of said outputs being connected to said first input of said unit for producing the second frequency derivative of the amplitude-frequency response of the oscillatory circuit, a third output of said outputs being connected to said second input of said electronic switch, to said second input of said second memory unit, and to said third input of said frequency modulator, a fourth output of said outputs being connected to said second input of said first memory unit;

said output of said peak detector being connected to said second input of said unit for producing the first frequency derivative of the amplitude-frequency response of the oscillatory circuit and to said second input of said unit for producing the second frequency derivative of the amplitude-frequency response.

4,136,314

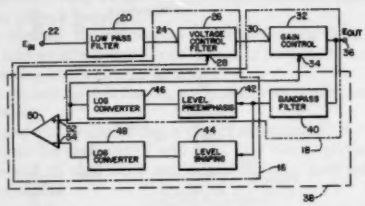
ADAPTIVE SIGNAL WEIGHTING SYSTEM

David E. Blackmer, Wilton, and C. René Jaeger, South Lyndeboro, both of N.H., assignors to DBX, Inc., Newton, Mass.

Division of Ser. No. 739,428, Nov. 8, 1976. This application Oct. 31, 1977, Ser. No. 846,722

Int. Cl.² H03B *3/02*

U.S. Cl. 328—167 **10 Claims**



1. An adaptive signal weighting system for use in electrical signal transmission, along a signal path said system comprising:

filter means disposed in said signal path and having electrical signal transmission characteristics capable of varying in response to a first control signal the relationship between the spectral region of dominant energy in a transmitted signal relative to the other spectral regions of the transmitted signal;

frequency discrimination means for sensing the spectral region of dominant signal energy in said transmitted signal and for providing said first control signal as a function of frequency of said dominant signal energy;

means for generating a second control signal, said second control signal being logarithmically related to the amplitude of said transmitted signal over at least a portion of the frequency range of said signal; and

gain control means disposed in said signal path and coupled in series with said filter means for applying a variable gain to said transmitted signal responsively to said second control signal.

4,136,315

LOW AND HIGH FREQUENCY OSCILLATORS HAVING COMMON VOLTAGE REGULATOR CIRCUIT

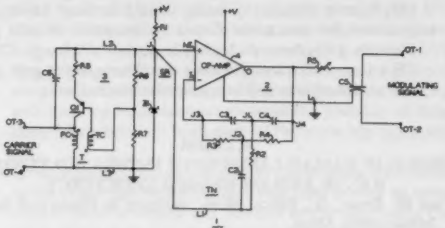
John J. Kuhn, Allison Park, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jul. 27, 1977, Ser. No. 819,659

Int. Cl.² H03B *3/00, 5/12, 5/26*

U.S. Cl. 331—46 **10 Claims**

1. A low and high frequency signal generating circuit comprising, a low frequency oscillating circuit including an operational amplifier having an inverting and noninverting input and an output, a twin-T feedback network coupled between the output and one of the inverting and noninverting inputs, a voltage regulating circuit connected to the other of the inverting and noninverting inputs, and a high frequency oscillating



circuit including a resonant feedback transistor amplifier being biased by voltage supplied by said voltage regulating circuit.

4,136,316

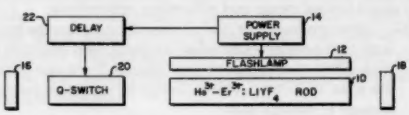
MULTI-COLOR, ACTIVATOR-ACTIVATOR LASER

Evan P. Chicklis, Nashua, N.H., and Charles S. Naiman, Brookline, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 19, 1977, Ser. No. 760,486

Int. Cl.² H01S *3/16*

U.S. Cl. 331—94.5 F **13 Claims**



1. A laser, comprising:

a laser rod aligned within a resonant cavity;

said rod comprising a host material of lithium yttrium fluoride and at least two different active laser ions; and

means for pumping said laser rod.

4,136,317

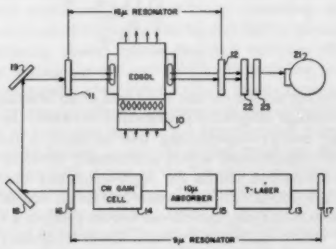
14 AND 16 MICRON, OPTICALLY PUMPED, GAS DYNAMIC CO_2 LASER

Joseph A. Stregack, Silver Spring, and Thomas J. Manuccia, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 13, 1977, Ser. No. 787,115

Int. Cl.² H01S *3/09*

U.S. Cl. 331—94.5 G **1 Claim**



1. A 16 micron gas-dynamic CO_2 laser which comprises:

an electric discharge gas dynamic CO_2 laser;

means for pumping said CO_2 laser;

a D_2-A, vibrationally excitable gas mixture mixed with CO_2

in said laser to produce a 9μ transition in said gas dynamic CO_2 laser resonant cavity; and

means for saturation of said 9μ transition in said gas dynamic CO_2 laser to ensure 16μ lasing in said resonant cavity;

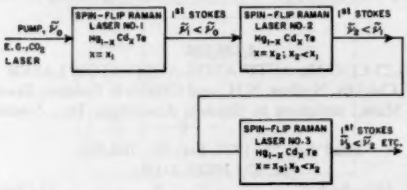
said means for saturation of said 9μ transition in said gas dynamic CO_2 laser including a double discharge CO_2-TEA laser cell, a low-pressure continuous wave gain cell and an absorption cell in a common resonator.

4,136,318

SPIN-FLIP RAMAN LASER WITH INCREASED TUNING RANGE AND INCREASED EFFICIENCY

Paul W. Kruse, Jr., Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 9, 1977, Ser. No. 794,889
Int. Cl.² H01S 3/18
U.S. Cl. 331—94.5 N **17 Claims**



1. Improvements in spin-flip Raman laser apparatus having increased tuning range and efficiency comprising:

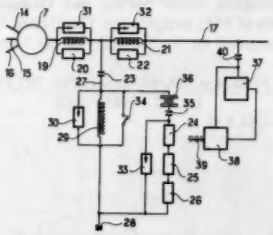
alloy semiconductor crystal resonant cavity means having at least two optically cascaded portions, said portions exhibiting a selected compositional change from one portion to the next, said composition change being accompanied by a change in energy gap.

4,136,319

FILTERING DEVICE FOR HIGH-VOLTAGE POWER LINES USED AS HIGH-FREQUENCY TRANSMISSION MEDIA

Michel Bourde, Paris, France, assignor to CGEE Alstlom S.A., Levallois-Perret, France

Filed Mar. 23, 1977, Ser. No. 780,383
Claims priority, application France, Mar. 26, 1976, 76 08876
Int. Cl.² H03H 7/14, 7/04; H04B 3/56
U.S. Cl. 333—1 **6 Claims**



1. A filtering device for use at an end of an isolation section in a high-voltage electricity distribution network; the network comprising energy-transporting line sections which extend between sub-stations and which additionally perform the function of transmission media for high-frequency carrier-wave telecommunications between communications sets of adjacent ones of the sub-stations; the carrier-waves lying in a frequency range ΔF which extends between a lower frequency f and an upper frequency F; the isolation section being one of said line sections over which telecommunications take place in n frequency bands lying within said frequency range ΔF and none of which n bands are used in any of the other line sections connected to the sub-stations of the said isolation section; the filtering device comprising:

a blocking filter comprising an inductance for connection in series between the end of the isolation section and the sub-station, and a tuning circuit connected in parallel with the inductance and adjusted to block frequencies in the lower part of said frequency range ΔF;

a capacitor with one terminal connected to the isolation section side of said blocking filter;

a drain coil connected in series between the other terminal of the capacitor and earth; and

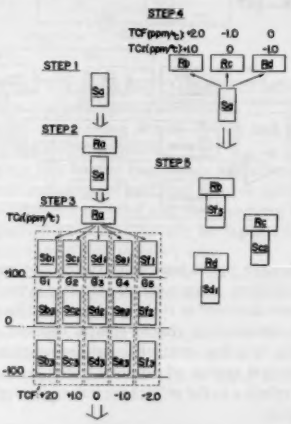
a selective filter assembly connected in parallel with said drain coil and adjusted to stop the said n frequency bands of the isolation section.

4,136,320

METHOD OF CONSTRUCTING DIELECTRIC RESONATOR UNIT AND DIELECTRIC RESONATOR UNIT PRODUCED THEREBY

Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jun. 10, 1977, Ser. No. 805,573
Claims priority, application Japan, Jun. 14, 1976, 51-70261
Int. Cl.² H01P 1/30, 7/00
U.S. Cl. 333—82 BT **8 Claims**



1. A process for manufacturing a dielectric resonator unit for use in filtering microwaves, said dielectric resonator unit comprising a dielectric resonator having an inherent TCε and a supporting spacer having an inherent TCε and bonded onto said dielectric resonator so as to make the composite TCF of said dielectric resonator unit substantially equal to a predetermined value, TCε standing for the temperature coefficient of dielectric constant and TCF standing for the temperature coefficient of resonator frequency, said process comprising the steps of:

(a) preparing a reference supporting spacer having a reference value of the inherent TCε and a reference dielectric resonator having a reference value of the inherent TCF;

(b) coupling said reference dielectric resonator with each of a plurality of supporting spacers and measuring the apparent TCF of the respective supporting spacers as an indication of the degree to which the TCF of a dielectric resonator will be affected by each of the respective supporting spacers, and coupling said reference supporting spacer with each of a plurality of dielectric resonators and measuring the inherent TCF of the respective resonators; and

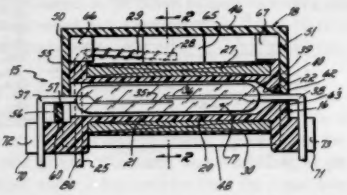
(c) coupling one of said plurality of dielectric resonators with a selected one of said supporting spacers, said selected one of said supporting spacers having an apparent TCF which affects the inherent TCF of said dielectric resonator for making the composite TCF of the dielectric

resonator unit substantially equal to said predetermined value.

4,136,321
REED RELAY ASSEMBLY AND THE METHOD OF MAKING SAME

Philip N. Smith, Cincinnati, Ohio, assignor to Standex International Corporation, Andover, Mass.

Filed Apr. 4, 1977, Ser. No. 784,274
Int. Cl.[2] H01H *51/28*
U.S. Cl. 335—151 7 Claims

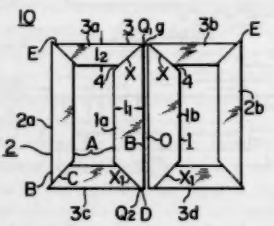


1. A reed switch assembly comprising,
a bobbin having a coil wound thereon,
said bobbin having a bore therethrough, said bore terminating in a small aperture,
a glass-encased switch having leads projecting from each end, said switch being disposed in said bore with one lead projecting through said aperture,
a cover on said bobbin having a top wall, side walls, and two end walls,
one of said end walls having a slot of substantially the same width as the diameter of said lead, said slot overlying the large end of said bore and receiving said lead wire to immobilize it.

4,136,322
SINGLE-PHASE THREE-LEGGED CORE FOR CORE TYPE TRANSFORMER

Masaaki Maezima, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 30, 1976, Ser. No. 746,000
Claims priority, application Japan, Dec. 5, 1975, 50-145412
Int. Cl.[2] H01F *27/08, 27/26*
U.S. Cl. 336—60 12 Claims

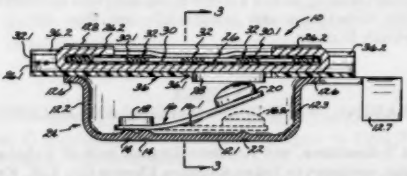


1. A single-phase three-legged core for a core type transformer comprising:
a main leg of substantially circular cross-sectional shape constituted by laminating a plurality of pairs of main leg steel sheets into masses of laminations having a stepwise varying width, each sheet having at both ends thereof diagonally cut sides, said main leg steel sheets of each pair being spaced from each other with a predetermined space to define an oil duct;
a pair of side legs constituted by laminating a plurality of side leg steel sheets into masses of laminations, each side leg steel sheet having at both ends thereof diagonally cut sides, said side legs being spaced at opposite sides of the main leg such that their diagonally cut sides are opposite diagonally cut sides of said main leg; and
a pair of yokes of non-circular cross-sectional shape constituted by laminating a plurality of yoke steel sheets into masses of laminations which are non-circular in cross-section, each of said yoke steel sheets having at both ends thereof diagonally cut sides adapted to form miter joints in cooperation with the diagonally cut sides of the side leg and main leg steel sheets so as to form a plurality of magnetic joints between both ends of the main leg and a side leg;
wherein a predetermined one of said plural joints is provided at the outer side thereof with a first joint having an outer corner point at which the vertices of the diagonally cut sides of the main leg steel sheet and the yoke steel sheet meet, and wherein another main leg steel sheet is disposed at the side of the yoke steel sheet of said first joint in overlapped-relation to said first joint so as to form a second joint in which the diagonally cut side of said another main leg steel sheet is miter-joined to the corresponding diagonally cut side of another yoke steel sheet, the joint angle of said first joint being made to be of the same value as that of the second joint, and wherein a recess is provided at the inner side of each of said joints on the side of the wider steel sheet of the respective cooperating steel sheets;
and wherein in each of said first and second joints the effective width in the joint area of the wider steel sheet of the respective cooperating steel sheets is greater than the width of the cooperating narrower steel sheet and the joint angle with respect to the longitudinal axis of the respective cooperating wider steel sheet is greater than 45° so that undesirable local concentrations of magnetic flux are avoided.

4,136,323
MINIATURE MOTOR PROTECTOR

John R. D'Entremont, 12 Alexander Rd., Foxboro, Mass. 02035, and Jan A. Abcouwer, Borg Ewsum 72, Almelo, Netherlands

Filed Jun. 1, 1977, Ser. No. 802,406
Int. Cl.[2] H01H *61/02*
U.S. Cl. 337—107 5 Claims

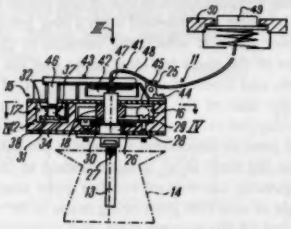


1. A motor protector comprising an open-ended electrically conductive metal can having a flange extending around the open can end, an electrically conductive lid for the can, electrically insulating gasket means disposed between the lid and flange for sealing the can and electrically isolating the lid from the can, thermally responsive switch means disposed within the can for electrically connecting and disconnecting the lid and can in response to selected temperature changes, said gasket means having a pair of lateral portions folded over respective opposite edges of the lid and said flange having a pair of portions folded over said respective lateral portions of the gasket means for securing the lid to the can while maintaining electrical isolation of the can from the lid, characterized in that an electrical resistance heater means is disposed in heat-transfer relation to an exterior surface of the lid for selectively heating the switch means, and said lateral portions of the gasket means are fitted over respective portions of said heater means for securing the heater means to the lid while maintaining electrical isolation of the heater means from the can.

4,136,324
EXPANSION BOX TEMPERATURE REGULATOR FOR ELECTRIC APPLIANCES

Karl Fischer, Am Gaensberg, and Manfred Schwarze, Rote-Tor-Strzsse 53, both of 7519 Oberderdingen, Fed. Rep. of Germany

Filed Sep. 10, 1976, Ser. No. 722,317
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540499
Int. Cl.[2] H01H *71/18*
U.S. Cl. 337—139 **12 Claims**



1. A temperature regulator for an electrical appliance, comprising: an expansion box, the expansion box being connectible to a temperature sensor such as to vary the pressure in the box with the temperature sensed by the sensor;

an adjustment member mounted to act on one side of the expansion box; a transmission lever mounted to be acted upon by the opposite side of the transmission box;

a snap switch located to be acted upon, to cause switching thereof, by said transmission lever on expansion and contraction of the expansion box;

the transmission lever extending closely over the expansion box;

a cam switch for mains or signal line connection, the cam of which is operated by said adjustment member;

and a switch housing;

said snap switch and said cam switch being mounted within a recess formed in the switch housing and open at the side thereof adjacent the transmission lever and the assembly formed by the expansion box and the transmission lever being of a height not substantially greater than the height of the housing and of a width in the direction transverse to the transmission arm substantially less than that of the switch housing.

4,136,325
ULTRASONIC WAVE TRANSMITTING AND RECEIVING APPARATUS

Kinya Takamizawa, and Kazuhiro Iinuma, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 23, 1976, Ser. No. 699,227
Claims priority, application Japan, Jun. 24, 1975, 50-78067
Int. Cl.[2] G01S *9/66, 7/62*
U.S. Cl. 340—1 R **11 Claims**

1. An ultrasonic wave transmitting and receiving apparatus comprising:

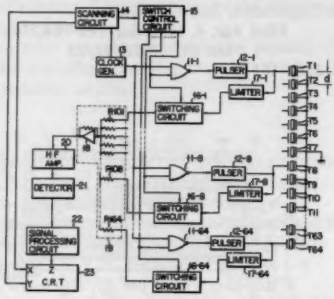
a plurality of electrical-acoustic converting elements arranged in a predetermined pattern of array,

energizing means for energizing the electrical-acoustic converting elements to generate ultrasonic wave signals,

storing means comprising at least three memory sections for storing electric signals corresponding to ultrasonic wave signals reflected from a to-be-measured subject and received by the electrical-acoustic converting elements,

display means for displaying information corresponding to ultrasonic wave signals received by the electrical-acoustic elements,

a control circuit for producing a control signal to causee the memory sections to sequentially set in write-in and read-out modes, for sequentially supplying a write-in command signal with a predetermined frequency to at least one of the memory sections which is set in the write-in mode to sequentially write an electric signal at a predetermined rate into the memory section and for sequentially supplying a readout command signal with a frequency higher



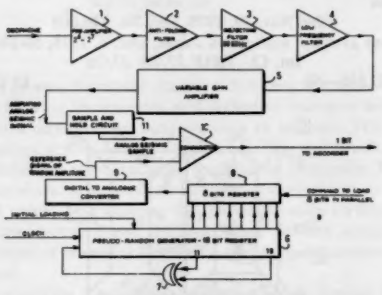
than that of the write-in command signal to the other memory sections to read out the contents of the other memory sections at a rate higher than the predetermined rate, and

a weight setting circuit for imparting weight to output signals of the memory sections.

4,136,326
APPARATUS FOR OBTAINING SEISMIC DATA

Jean-Claude Naudot, Nantes, and Roger Cholez, La Chapelle sur Erdree, both of France, assignors to Societe d'Etudes, Recherches et Construction Electroniques (Sercel), Carquefou, France

Filed Jul. 19, 1976, Ser. No. 706,384
Claims priority, application France, Jul. 18, 1975, 75 22562
Int. Cl.[2] G01V *1/00*
U.S. Cl. 340—15.5 DP **6 Claims**



1. Apparatus for field recording of digital seismic data, comprising:

an array of seismic sensors disposed relative to a subsoil structure and capable of delivering respective analog seismic signals in response to a seismic perturbation in said subsoil structure, said sensors being arranged in groups, each group associated with a digitizing unit, and said analog seismic signals containing information about said subsoil structure;

a plurality of digitizing units, each connected to receive the analog seismic signals from a respective said group of sensors;

means for interconnecting said plurality of digitizing units to

form a digital communication channel, said digital communication channel having an input and an output;

means coupled for recording digital signals appearing at the output of said digital communication channel;

means for supplying predetermined control signals to the input of said digital communication channel;

controllable means for supplying pseudo-random digital words to the input of said digital communication channel; and

first control means for causing said pseudo-random digital word supplying means to send a plurality of different pseudo-random digital words through said digital communication channel at the outset of each recording operation, each said word being preceded by a said predetermined control signal from said control signal supplying means; and

wherein each said digitizing means comprises:

means including a multiplexer and a variable gain amplifier for processing the analog seismic signals from the associated said group of sensors, and delivering at an output amplified and leveled samples from the respective analog seismic signals in sets, each said set including in sequence a sample of the analog seismic signal from each said sensor of the group;

means for locally generating pseudo-random digital signals by substantially random selection from a predetermined scale of digital reference signals;

means for converting successive said pseudo-random digital signals into corresponding successive analog reference signals which are substantially random between themselves within a predetermined amplitude range;

means for comparing each of said amplified and leveled samples with a respective one of said substantially random analog reference signals and for delivering at an output a one-bit binary signal upon each comparison;

a local digital word register coupled to the output of said comparing means for storing the one-bit binary signals therefrom;

second control means for synchronously operating said multiplexer, said variable gain amplifier, said pseudo-random digital generating means and said digital word register, whereby said digital word register receives sets of said one-bit binary signals corresponding to respective sets of said amplified and leveled analog signal samples and stores said sets as respective seismic digital words;

means having an input and an output, for coupling said digitizing unit to said interconnecting means and for normally transmitting digital signals from said input thereof to said output thereof; and

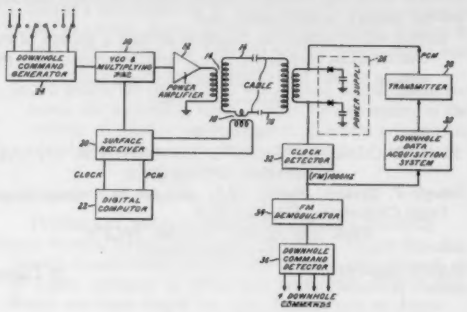
third control means for (a) initially responding to a said predetermined control signal by causing one of said pseudo-random words applied to the input of the digital communication channel to be received into said local digital word register and loaded in said local pseudo-random generating means, and for modifying the particular control signal responded to so that such control signal will be ignored by the subsequent digitizing units of the digital communication channel; and for (b) subsequently interrupting said normal transmission of digital signals through said coupling means and causing said local digital word register to transfer a said seismic digital word through said output of said coupling means in response to a said predetermined control signal, and for modifying the particular control signal responded to so that such control signal will be ignored by the subsequent digitizing units.

4,136,327

WELL SURVEY SYSTEM MODULATION TECHNIQUE

Thomas E. Flanders, Houston, and Herbert E. Moore, Pauline, both of Tex., assignors to General Electric Company, Fairfield, Conn.

Filed Jul. 22, 1977, Ser. No. 817,909
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 FM **2 Claims**



1. The method of simultaneously transmitting from the earth's surface over the same pair of conductors power and commands to control equipment down a bore hole and receiving information signals from the bore hole which comprises the steps of

(a) applying an alternating voltage across the said pair of conductors at the earth's surface;

(b) providing power-using equipment in the bore hole, connected across the said pair of conductors;

(c) modulating the frequency of the said alternating voltage to signify an impulse as part of a command signal;

(d) in the bore hole, detecting the modulation of the frequency of the alternating voltage and decoding it as part of a command signal;

(e) in the bore hole, altering the phase relation between the alternating voltage and the current drawn by apparatus in the bore hole; to signify an impulse as part of an information signal;

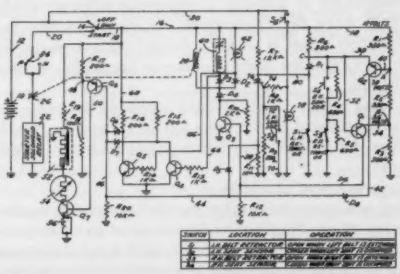
(f) at the earth's surface, detecting the altered phase relation between the alternating voltage and the current being fed into the said pair of conductors, and decoding it as part of an information signal.

4,136,328

TAMPER-PROOF SEATBELT SYSTEM

Bruce P. Cambern, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 14, 1972, Ser. No. 226,101
Int. Cl.[2] B60R *21/10*
U.S. Cl. 340—52 E **15 Claims**



1. A tamper-proof electrical circuit for a motor vehicle having at least one seating position equipped with a retractable

seatbelt for the protection of an occupant of said seating position, said electrical circuit comprising:

first switching means for sensing whether said seatbelt is in a retracted or in an extended position;

second switching means for sensing whether or not said seating position is occupied;

first circuit means for sensing a condition in which said first switching means indicates that said seatbelt is in an extended position while said second switching means indicates that said seating position is unoccupied; and

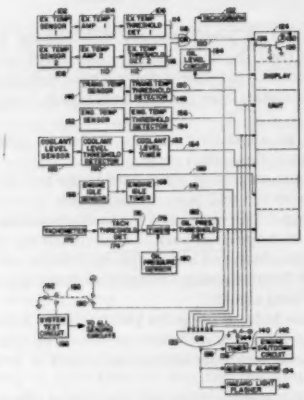
second circuit means for disabling at least a portion of the electrical circuitry in said motor vehicle subsequent to the sensing by said first circuit means of said condition.

4,136,329

ENGINE CONDITION-RESPONSIVE SHUTDOWN AND WARNING APPARATUS

Joseph F. Trobert, Sparta, N.J., assignor to Transportation Logic Corporation, Wharton, N.J.

Filed May 12, 1977, Ser. No. 796,370
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—52 F **21 Claims**



1. In an apparatus which functions in response to the occurrence of one or more adverse engine operating conditions for disabling a normally-energized switch controlling the operation of said engine, wherein said apparatus comprises:

at least one sensing means coupled to said engine, each of said sensing means being responsive to a respective engine operating condition to provide a condition signal having a value which is indicative of said condition;

at least one threshold detecting means, each of said threshold detecting means being coupled to receive the condition signal from a respective one of said sensing means and conditioned to provide a respective adverse condition signal when the value of the associated sensing means condition signal is within a predetermined range which indicates that the respective engine operating condition is adverse;

indicating means coupled to said threshold detecting means and responsive to the presence of an adverse condition signal for providing an indication of said adverse condition;

the improvement comprising:

timing means coupled to said threshold detecting means and responsive to the continued presence of an adverse condition signal for timing a predetermined interval and providing an output signal at the termination of said interval;

means responsive to said timing means output signal for disabling said engine; and

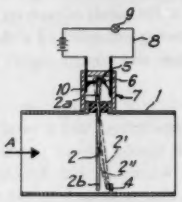
manually operable switch means coupled to said timing means for restarting said timing means when said manually operable switch means is momentarily operated.

4,136,330

DEVICE FOR MONITORING THE FLOW AND TEMPERATURE OF A COOLANT

André F. Estaque, Bagneux, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Nov. 1, 1976, Ser. No. 737,708
Claims priority, application France, Nov. 28, 1975, 75 36585
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—52 F **11 Claims**



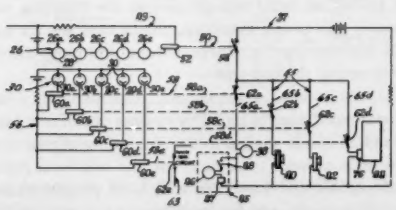
1. In an automobile, a device for monitoring the flow and temperature of the coolant in the internal combustion engine, constituted by at least one switch of the electrical supply circuit for an alarm system, wherein the mobile part of said switch is controlled mechanically by a single flow and temperature detector disposed at a single point in the coolant circuit, said detector being constituted by a tongue comprising an element which deflects under the effect of the temperature and which extends transversely in a pipe of the coolant circuit, said tongue being pivoted by one of its ends about a pin disposed perpendicular to the direction of circulation of fluid and operatively supported on said pipe, a stop provided in the pipe, and an elastic return member coupling the tongue with the pipe, said tongue being adapted to abut by its other end on said stop under the effect of the circulation of the fluid and against the effect of the elastic return member.

4,136,331

SPEED-CONTROL SYSTEM FOR AN ENGINE-POWERED VEHICLE

James H. Cullen, 1251 N. Harding Ave., Chicago, Ill. 60651

Continuation-in-part of Ser. No. 711,278, Aug. 3, 1976, abandoned. This application Jun. 6, 1977, Ser. No. 803,609
Int. Cl.[2] B60Q *1/54*
U.S. Cl. 340—53 **14 Claims**



1. Apparatus for producing control signals in an automobile having a speedometer, the speedometer having a dial with a speed-indicating scale thereon and a pointer movable over the dial, and the pointer having a first range of movement to indicate normal speed and a second range of movement beyond the first range to indicate excessive speed,

said apparatus comprising,

a main circuit including a plurality of control instrumentalities further characterized hereinbelow,

the speedometer including visual blocking means beyond said scale,

a series of PE means spaced along said scale in said second range behind said visual blocking means, each including a light bulb and a cell and the PE means being individually operatively associated with respective ones of said control instrumentalities,

the pointer of the speedometer having a shield thereon behind said visual blocking means, movable in association with the PE means and operative thereby for producing control signals in the PE means,

a first sub-circuit including said light bulbs in series with each other,

the apparatus incorporating a first relay means which includes a coil in the first sub-circuit and a normally open switch in the main circuit,

a second sub-circuit including said cells, the cells being parallel with each other,

the main circuit including a plurality of third sub-circuits, each including a respective one of said control instrumentalities, the third sub-circuits being parallel with each other, but each in series in the main circuit,

the apparatus including a plurality of second relay means each including a coil in circuit with and controlled by respective ones of said cells and a normally closed switch in a respective one of said third sub-circuits,

said first sub-circuit being operative, in response to all of said light bulbs being energized, for energizing the first relay means, closing the switch therein and thereby conditioning the main circuit for energization, and upon disabling of any of the light bulbs, enabling that switch to move to open position, and thereby to open the main circuit,

said PE means being serially arranged along said second range representing respectively increased speeds of said excessive speeds and the shield on said pointer controlling the PE means successively and in combination and thereby operative for energizing the respective control instrumentalities in successive manner whereby actuation of each control instrumentality indicates a corresponding excessive speed in said second range.

4,136,332
DEVICE FOR DETECTING DISPLACEMENT BETWEEN PATTERNS

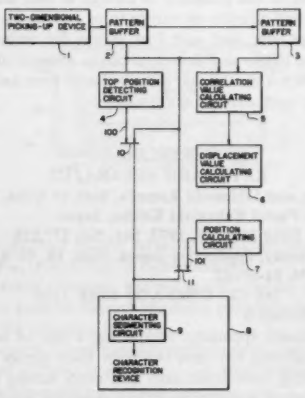
Shozo Kadota, and Yoshiji Fujimoto, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 26, 1977, Ser. No. 762,716

Claims priority, application Japan, Jan. 30, 1976, 51/8478; Jan. 30, 1976, 51/8481

Int. Cl.[2] G06K *9/12*

U.S. Cl. 340—146.3 H **11 Claims**



1. A device for detecting the displacement between successive fields of a pattern being scanned in a predetermined direction comprising:

first means for storing signals representing a field of said pattern detected at a selected interval;

second means connected to said first means for storing the signals which were stored in said first means during a previous interval, which field in said second means is relatively displaced in position with respect to the field now in said first means;

third means for obtaining correlation values between the first and second fields stored in said first and second means during a given interval by comparing the signals stored in said respective means as said fields are shifted relative to each other within said first and second means during said given interval by predetermined amounts;

fourth means for deriving as the position displacement between the successive fields a value corresponding to the number of relative shifts required to obtain a maximum correlation value from said third means.

4,136,333
TERMINAL SIGNAL OPERATION APPARATUS

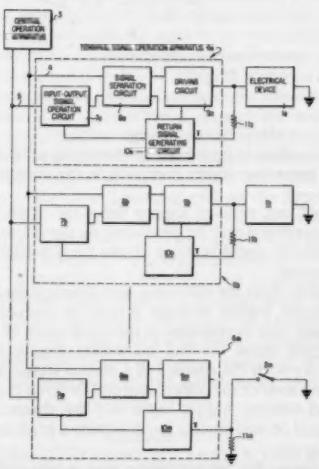
Shizuo Sumida; Kazuo Nii, both of Hiroshima; Osamu Shimizu, Himeji; Atsushi Ueda, Himeji, and Mitsuaki Ishii, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Toyo Kogyo Co., Ltd., Hyogo, both of, Japan

Continuation-in-part of Ser. No. 678,443, Apr. 19, 1976, abandoned, which is a continuation of Ser. No. 501,987, Aug. 30, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,776

Claims priority, application Japan, Sep. 3, 1973, 48-99405; Fed. Rep. of Germany, Sep. 3, 1974, 2442067

Int. Cl.[2] H04Q *9/00*

U.S. Cl. 340—147 C **30 Claims**



1. A signal operation apparatus for controlling a plurality of electrical devices comprising: central operation means for generating a control signal for the electrical devices, a plurality of terminal operation means, signal transmitting means for transmitting signals between the central operation means and the plurality of terminal operation means, each terminal operation means corresponding to an electrical device for driving the corresponding electrical device depending upon the control signal and for forming a composite signal on the signal transmitting means indicating the state of the corresponding electrical device, each of the plurality of terminal operation means comprising input-output signal operation circuit means for receiving the control signals of the central operation means, signal separation circuit means for discriminating the control signals for the corresponding electrical device, driving circuit means responsive to the control signal for the corresponding electrical device for operating the electrical device, return signal generating circuit means for generating a return

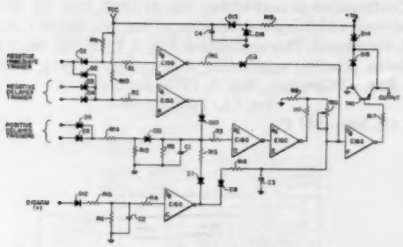
signal upon detection of a malfunction of the electrical device, the input-output signal operation circuit means also functioning for combining the control signal for the corresponding electrical device and the return signal to form the composite signal on the signal transmitting means, means for connecting the signal separation circuit means to the input-output signal operation circuit means, means for connecting the signal separation circuit means to the driving circuit means, means for connecting the signal separation circuit means to the return signal generating circuit means, means for connecting the driving circuit means to the return signal generating circuit means, means for connecting the driving circuit means to the corresponding electrical devices, and means for connecting the input-output signal operation means to the return signal generating circuit means.

4,136,334

TIMED ALARMING USING LOGICAL INVERTERS

Monte G. Seifers, Waltham, Mass., assignor to Digequip Security Industries, Inc., Nashville, Tenn.

Filed Jun. 21, 1977, Ser. No. 808,672
Int. Cl.[2] G08B *13/22*; B60R *25/10*
U.S. Cl. 340—529 **8 Claims**



1. Alarm circuitry comprising,
an immediate trigger input for receiving a signal for causing an immediate alarm condition in the absence of a disarm signal,
at least one delayed trigger input for receiving an alarm triggering signal for providing an alarm condition only if a disarm signal remains absent for a predetermined time interval,
a disarm input for receiving said disarm signal,
an output logical inverter means for providing an alarm signal only in response to the occurrence of an immediate trigger signal on said immediate trigger input concurrently with the absence of a disarm signal on said disarm input and/or the occurrence of a delayed trigger signal on said delayed trigger input and the absence of a disarm signal on said disarm input outside a predetermined delay interval,
and means for intercoupling said inputs and said output inverter,
the latter means for intercoupling consisting only of diodes, resistors, capacitors and inverters,
whereby the quiescent current drawn by said circuitry in the absence of an alarm condition is negligible.

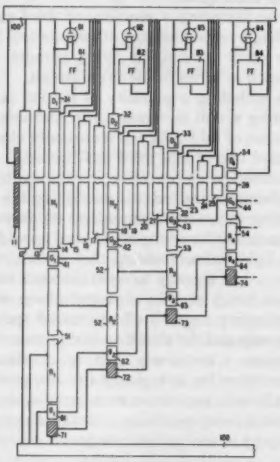
4,136,335

SEMICONDUCTOR CHARGE COUPLED DEVICE ANALOG TO DIGITAL CONVERTER

Michael F. Tompsett, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1977, Ser. No. 788,546
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD **3 Claims**

1. A semiconductor charge coupled device containing a spatial sequence of charge storage cells in a semiconductor body for propagating an analog charge of packets injected in accordance with an analog input signal, each cell containing a selected transfer site, characterized in that in proximity to each selected transfer site is located a different corresponding auxiliary charge storage site plus
(a) first means for transferring all analog charge stored at a first predetermined time in the selected site of the main sequence into the corresponding auxiliary site,
said first means for transferring at a second, later predetermined time from said auxiliary site back to said selected site a first quantity of charge, said first quantity of charge being equal to the excess, if any, in charge content of said analog charge over one-half the storage capacity of said selected site, thereby leaving in said auxiliary site a second quantity of charge equal to said one-half the storage capacity if said analog charge is greater than said one-half



the said storage capacity, and said first quantity being equal to zero otherwise, thereby leaving in said auxiliary site all said analog charge,
(b) second means for detecting the presence or absence of charge in said selected site at a third predetermined time subsequent to said second predetermined time, thereby generating a binary output signal corresponding to the detection of said presence or absence of charge in said selected site,
said first means for transferring, in response to the said detection of the presence of charge in said selected site, said second quantity of charge from said auxiliary site into a charge sink, and said first means for transferring, in response to the said detection of the absence of charge in said selected site, all said analog charge from said auxiliary site into said selected site.

4,136,336

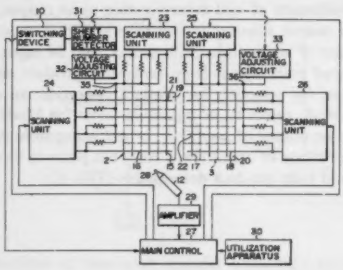
KEYBOARD APPARATUS

Kiyomi Abe, and Hidetoshi Kameda, both of Soka, Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed Mar. 15, 1977, Ser. No. 777,826
Claims priority, application Japan, Mar. 19, 1976, 51-29348; May 14, 1976, 51-55162
Int. Cl.[2] G08C *1/00*; G06F *3/02*
U.S. Cl. 340—365 S **11 Claims**

1. A keyboard apparatus comprising a pair of tablets each internally carrying two sets of driver lines spaced apart and disposed along coordinate axes and each having its surface subdivided into a multiplicity of key segments associated with each point of intersection between the sets of driver lines; two pairs of scanning units, each pair of scanning units being connected with the two sets of driver lines of one of the tablets, the

scanning units being alternately activated to supply a drive signal to the sets of driver lines in a manner such that at least one of each pair of scanning units supplies one set of driver lines of the associated tablet with a drive signal which is time displaced from any drive signal supplied by one of the other pair of scanning units; an overlay unit including a plurality of overlays bound in the form of a book so that each overlay can assume an open position on either tablet, each overlay having indicium segments at positions corresponding to the key segments; a selection switching device for producing a signal



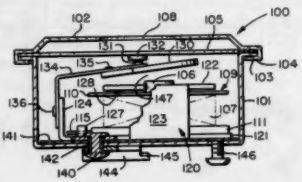
which identifies which one of the overlays assumes an open position on at least one of the tablets; a probe for sensing the drive signal from a desired key segment on a selected one of the tablets through the overlays disposed on the tablet; and a control unit for supplying a control signal to each of the scanning units and for receiving an output signal from the probe, the control unit producing a digital signal indicative of a desired indicium segment of a particular overlay which assumes an open position on the selected tablet and against which the probe is applied, said particular overlay being specified by an output signal from the selection switching device.

4,136,337

BUZZER ASSEMBLY

Carl M. Larime, Fairfield, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,099
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 R **16 Claims**



1. An improved buzzer structure designed for automated assembly and comprising in combination:

(a) a bobbin assembly having a coil wound thereon and having parallel flanges spaced a predetermined distance apart for retaining said coil;

(b) a magnetic frame having parallel surfaces separted by an amount slightly in excess of said predetermined distance for accommodating bobbin insertion; and

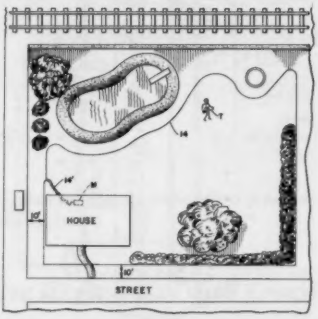
(c) interference means between said bobbin assembly and said parallel frame surfaces, effective after partial insertion of said bobbin, for retaining said bobbin assembly and said frame in a predetermined relative orientation.

4,136,338

PERIMETER ALARM APPARATUS

Ronald L. Antenore, Coral Gables, Fla., assignor to James D. Pauls & Associates, Ltd., Miami, Fla.

Filed Mar. 8, 1977, Ser. No. 775,478
Int. Cl.[2] H04B *5/00*
U.S. Cl. 340—551 **10 Claims**



1. A perimeter alarm apparatus for guarding or monitoring a designated area to determine the presence or absence of designated persons or objects within the area, comprises: a transmitter having means for attachment thereof to the designated person or object; said transmitter having electrical circuit means for continuously and cyclically producing a changing magnetic field, said electrical circuit means including a plurality of coils arranged angularly relative to one another and connected with means for alternately and sequentially energizing the coils whereby a plurality of changing magnetic fields of different polarity are produced to minimize the effect of different orientations of the transmitter; a monitor for monitoring the presence of the transmitter and including a wire loop extending around the perimeter of the designated area; monitor electrical circuit means connected with the wire loop for detecting the presence of a signal induced on the loop by the magnetic coupling between the transmitter and loop; said changing magnetic field and wire loop being related such that a signal of proper strength is magnetically induced on the loop whenever the transmitter is within the area bounded by the loop, but when the transmitter is a predetermined distance beyond the boundary defined by the wire loop, a proper signal is not imposed on the loop; and alarm means connected with said monitor electrical circuit means for indicating when the transmitter is not inducing a proper signal on the loop.

4,136,339

CORONA REDUCING APPARATUS FOR A SUBMERSIBLE ELECTRICAL FUSE

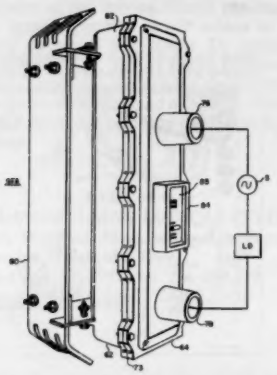
Edmund W. Kuhn, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 2, 1977, Ser. No. 773,460
Int. Cl.[2] G08B *21/00*; H01H *85/32*
U.S. Cl. 340—638 **5 Claims**

1. A fuse assembly, comprising:

(a) enclosure means having a pair of spaced terminals thereon which extend from the inside of said enclosure means to the outside thereof, the inside surface of said enclosure means being substantially covered in two regions with a layer of conducting material, said later material not being present in a third region which exists between said spaced terminals, said third region being substantially covered by a thin layer of semiconducting material, said semiconducting material having a raised ridge portion which also overlaps the interface where said conducting material terminates on said inside surface to reduce corona in the region of said interface;

(b) fuse means disposed within said enclosure means in circuit relationship with said spaced terminals, said conductive material and said semiconductive material cooperating to reduce corona within said enclosure when said fuse is electrically energized, said semiconductive material



isolating said two conducting regions when said fuse is blown; and

(c) indicator means disposed outside of said enclosure means but capacitively coupled to at least one of said two conductive regions within said enclosure means to give an indication when said fuse is blown.

4,136,340

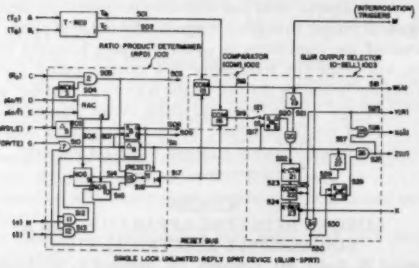
SEQUENTIAL PROBABILITY RATIO TEST FOR FRIEND IDENTIFICATION SYSTEM

Walton B. Bishop, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1978, Ser. No. 873,745

Int. Cl.[2] G01S *9/02, 9/56*

U.S. Cl. 343—5 DP **7 Claims**



1. A single-look, unlimited-reply sequential probability ratio test device SLUR-SPRT for use in a Friend Identification system, said Friend Identification system having the following inputs available to said SLUR-SPRT device: T_C - upper threshold number, T_B - lower threshold number, R_O- a-priori probability ratio, p(a/f)-probability that an acceptable reply will be received in response to any particular interrogation selected at random from those sent to a friend, $p(a/\bar{f})$ probability that an acceptable reply will be received in response to any particular interrogation selected at random from those sent to an enemy, LE-leading edge pulse, TE-trailing edge pulse, (a)-acceptable reply pulse, $(\bar{a})$ - unacceptable reply pulse, M-interrogation trigger pulses, K-a number equal to or slightly greater than the average number of missed replies required by a trailing edge detector to produce a trailing edge declaration, comprising:

threshold register means for receiving, storing, and providing as outputs said upper threshold number T_C and said lower threshold number T_B;

ratio product determiner means receiving said inputs R_O, p(a/f), $p(a/\bar{f})$, LE, TE, (a), $(\bar{a})$ for producing a ratio product R_n after each said reply has been evaluated and providing R_n as an output, and additionally providing a delayed reset signal as an output;

comparator means for receiving and comparing said ratio product R_n and said inputs T_B and T_C from said threshold register to determine if R_n is greater than or equal to T_C less than or equal to T_B or between T_C and T_B and provide an indication of said determination as an output;

SLUR output selector means receiving said input K, said output of said comparator means, said M input and said delayed reset signal from said ratio product determiner means, for selecting for Mode 1 operation: an output of accept A, reject R, or unknown U; or for Mode 2 operation: an output of accept A, or not acceptable $\bar{A}$; and for either mode of operation, a reset bus pulse to be sent back to said ratio product determiner.

4,136,341

RADAR SYSTEM EMPLOYING TWO KINDS OF PULSES

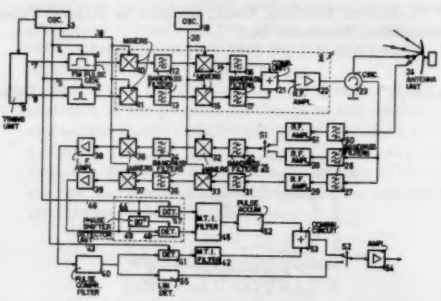
Willem Mulder, Borne; Antonius F. M. Bouman, Hengelo, and Johan M. C. Zwarts, Borne, all of Netherlands, assignors to Hollandse Signaalappareten, B.V., Hengelo, Netherlands

Filed Oct. 31, 1977, Ser. No. 846,692

Claims priority, application Netherlands, Nov. 12, 1976, 7612575

Int. Cl.[2] G01S *9/233, 9/42*

U.S. Cl. 343—17.2 PC **5 Claims**

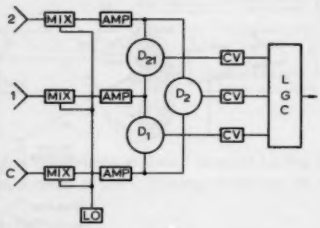


1. A radar system comprising a first generator for generating frequency-modulated transmitter pulses of relatively long duration, a second generator for generating transmitter pulses of relatively short duration at a pulse repetition frequency greater than that of said long duration pulses generated by said first generator, a transmitter channel, coupled to said first and second generators, for transmitting both the long and short duration transmitter pulses, and a receiver having a first receiving channel, including a pulse compression filter, for detecting return signals from the frequency-modulated transmitter pulses of relatively long duration, and a second receiving channel for detecting return signals from the transmitter pulses of relatively short duration.

4,136,342
RESOLVING ANGULAR AMBIGUITY

Robert N. Alcock, Reigate; David A. Lucas, Crawley Down, and Richard P. Vincent, Crawley, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,262
Claims priority, application United Kingdom, Mar. 15, 1976, 10256/76
Int. Cl.[2] G01S 5/02
U.S. Cl. 343—113 R 16 Claims



1. A method of resolving angular ambiguity in measurements of phase difference between a pair of signals comprising the steps of:

(a) measuring the phase difference between said pair of signals to obtain a first quantity representative of the ambiguous phase difference $2\pi F_1$ between said pair of signals, where F_1 is a fraction;

(b) deriving, from at least one signal of said pair of signals and a third signal, an unambiguous angle $2\pi (F_2 + I_2)$ which is ideally equal to the desired unambiguous phase difference $\Phi_1 = 2\pi (F_1 + I_1)$ between said pair of signals but may differ therefrom by an amount representative of an error angle of magnitude less than π radians, where F_2 is a fraction and I_1 and I_2 are either zero or an integer;

(c) generating a second and third quantity representative of the components $2\pi F_2$ and $2\pi I_2$, respectively, of said unambiguous angle;

(d) deriving, from said first and second quantities, a fourth quantity representative of the difference between said measured phase difference $2\pi F_1$ and said component $2\pi F_2$ of said unambiguous angle;

(e) calculating the value of $2\pi I$, by adding to said third quantity a quantity representative of $2\pi n$, where n is a plus one, a minus one or a zero depending on whether said fourth quantity is less, greater, or the magnitude thereof is less than a predetermined value, respectively; and

(f) adding the calculated of value of $2\pi I_1$ to said first quantity to obtain a quantity representative of the unambiguous value of said phase difference.

4,136,343
MULTIPLE SOURCE TRACKING SYSTEM

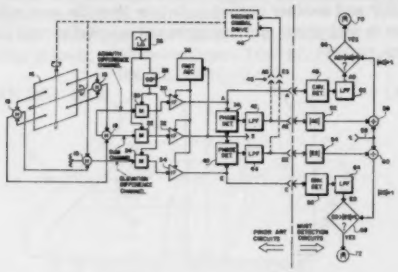
Roy W. Heffner, and Robert B. Blanning, both of Orlando, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed May 2, 1977, Ser. No. 792,957
Int. Cl.[2] G01S 3/42; F41G 7/00
U.S. Cl. 343—117 R 16 Claims

1. A detector for adapting a monopulse tracking receiver system to detect the presence of multiple radiating sources within the effective antenna beamwidth of the system comprising:

signal processing means connected to the outputs of said receiver system for comparing the relative amplitudes of the output signals from said receiver system; and

decision means connected to said signal processing means for providing an indication when the relative amplitudes

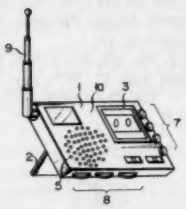


of such signals are characteristic of the presence of multiple radiating sources.

4,136,344
MINIATURE RECEIVING SET WITH A PIVOTABLE STAND

Toshihiro Nakao, and Kazumi Saito, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 810,919
Claims priority, application Japan, Jul. 22, 1976, 51-97876[U]
Int. Cl.[2] H01Q 1/12
U.S. Cl. 343—702 11 Claims



1. A miniature receiving set comprising a casing with a back wall having an opening, an antenna case provided within said casing, a telescopic rod antenna contained within said antenna case so as to be allowed to extend outward from said casing, a stand having one end provided with a pivotal portion pivotally supported by said antenna case and the other end extending outward from said back wall of said casing through said opening, said stand being capable of swinging round said antenna case to a working position where the other end thereof is kept away from said casing, and a retaining means provided between said casing and said stand to fix said stand in said working position.

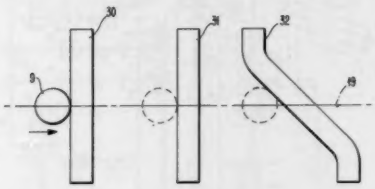
4,136,345
OBJECT DEFLECTION SENSOR

Mark H. Neville, Lexington, Ky., and Thomas S. Taylor, Atlanta, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,453
Int. Cl.[2] G01D 15/18
U.S. Cl. 346—75 29 Claims

1. An ink drop height sensing device for an ink jet recording apparatus, said apparatus including nozzle means for forming and propelling a stream of ink drops towards a recording media in a predetermined deflection plane, means to apply a charge to an ink drop, and means for deflecting said charged ink drop in said deflection plane; first, second and third serially arranged sensor means positioned substantially in a sensing plane essentially parallel to the deflection plane for sensing serially the passage of an ink drop, at least one of said sensors being a line sensor and positioned for sensing of an ink drop

after said ink drop has been deflected, said line sensor being skewed with respect to the path of said deflected ink drop in said deflection plane so that at least a portion of said line sensor is closer and another portion is farther than the next adjacent sensor in said plane, and timing means coupled to said sensors



to compare the time of occurrence of a drop sensed between two of said sensor means and the third sensor means to thereby give an indication as to whether the ink drop being sensed is high or low relative to a predetermined optimum height of said drop in said deflection plane.

4,136,346

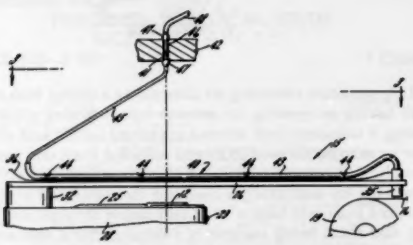
RECORDER PEN WITH INK JET WRITING DEVICE

Truman D. Parkinson, Mount Prospect, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 656,302, Feb. 9, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,736

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—140 R **5 Claims**



1. A chart recorder writing pen including, in combination, a motor having an oscillating output shaft responsive to the amplitude and frequency of the signal to be charted, a lever fixed on said shaft and having an end whose movement is proportional to the movement of the periphery of the shaft, an arm pivoted at one end on said lever end so as to swing in a plane spaced from and perpendicular to said shaft, means for controlling the pivoting of said arm so that the non-pivoted end of the arm moves in a linear path at an amplitude and frequency proportional to movement of said lever end, said path and said lever end being on opposite sides of said shaft, an ink jet pen mounted on the non-pivoted end of said arm perpendicular to said plane, means including an opening colinear with the axis of said shaft and spaced from said arm, means defining a conduit for ink and having a first, substantially rigid portion extending from said ink pen along said arm to the pivoted end thereof and further having a second portion doubling back from the pivoted end along a path which is fixed relative to said lever to pass through said opening colinearly with said axis, whereby whipping of said conduit portions is minimized, and means for supplying ink to said conduit.

4,136,347

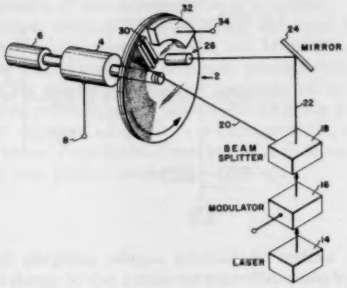
METHOD FOR MAKING A HOLOGRAPHIC TONE WHEEL FOR USE IN A SYNC-OFF-TACH TAPE DRIVE SYSTEM

Michael F. Braitberg, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 557,792, Mar. 12, 1975, Pat. No. 4,103,214. This application Jan. 10, 1977, Ser. No. 758,313

Int. Cl.[2] G03G *16/00*; G03H *1/06*

U.S. Cl. 346—151 **9 Claims**



1. A method of producing a tape drive means including the steps of driving a coaxial assembly of a motor, a capstan and a tone wheel at a predetermined rotational speed and concurrently recording a succession of one dimensional holograms radially arranged on said tone wheel.

4,136,348

MANUFACTURE OF GOLD BARRIER SCHOTTKY DIODES

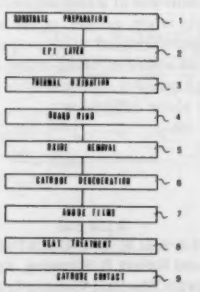
Guy Damene, Paris, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jul. 14, 1977, Ser. No. 815,512

Claims priority, application France, Aug. 3, 1976, 76 23649

Int. Cl.[2] H01L *29/48, 29/56*

U.S. Cl. 357—15 **5 Claims**

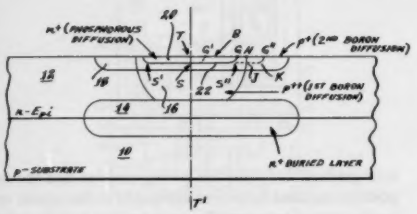


1. Process for the manufacture of Schottky diodes with a guard ring and a gold-silicon barrier, consisting in that a film of reducing metal having a thickness between several thousand and two hundred angstroms is deposited on the silicon prior to the deposition of the barrier metal film, the structure being subjected to a heat treatment which ensures diffusion of the barrier metal through the reducing film at a temperature above 300° C. but below the formation temperature of the gold-silicon eutectic.

4,136,349
IC CHIP WITH BURIED ZENER DIODE

Wei K. Tsang, Bedford, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 27, 1977, Ser. No. 801,410
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 5 Claims



1. An IC chip comprising a planar element having a Zener diode junction formed of the following overlying set of diffusions:

(a) a deep p diffusion;

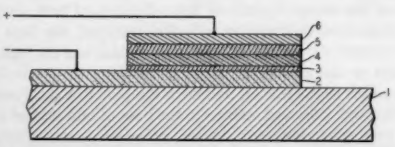
(b) a shallow p diffusion over said deep diffusion and having at least one side edge which is laterally beyond the corresponding side edge of said deep diffusion in one plane perpendicular to the surface of said element; and

(c) an n diffusion over said shallow p diffusion, said n diffusion being shallower than said shallow p diffusion and positioned wholly within the lateral limits of said deep p diffusion in said one plane.

4,136,350
EPITAXIAL GROWTH OF DISSIMILAR MATERIALS

Ping K. Tien, Chatham Township; Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 14, 1977, Ser. No. 815,720
Int. Cl.[2] H01L *29/161, 33/19*
U.S. Cl. 357—16 6 Claims



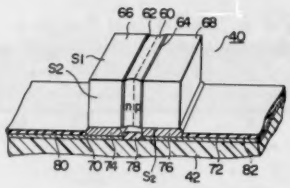
3. An integrated-optics apparatus comprising a first layer formed from a garnet compound having a first lattice constant A_1,

a second layer formed from a compound comprising elements from groups III and V of the Periodic Table of the Elements having a second lattice constant A_2, which two lattice constants form two ratios A_1/A_2 and A_2/A_1, only one of which two ratios is substantially equal to an integer, said second layer being grown epitaxially onto a portion of said first layer, at least two optical devices, one of said optical devices being epitaxially grown directly onto said first layer and a second one of said optical devices being epitaxially grown onto said second layer.

4,136,351
PHOTO-COUPLED SEMICONDUCTOR DEVICE

Yoshitaka Sugawara; Tatsuya Kamei; Susumu Murakami; Tadahiko Miyoshi, and Takuzo Ogawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 28, 1977, Ser. No. 792,002
Claims priority, application Japan, May 12, 1976, 51-53921
Int. Cl.[2] H01L *31/12*
U.S. Cl. 357—19 9 Claims

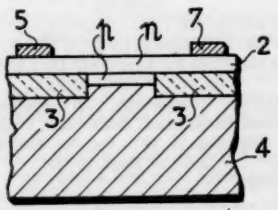


1. A photo-coupled semiconductor device comprising a light-emitting semiconductor element, a light-receiving semiconductor element, and means for supporting said two semiconductor elements, wherein said supporting means comprises first and second substrates extending in parallel to each other, said first substrate supporting said light-emitting semiconductor element and said second substrate supporting said light receiving semiconductor element, said second substrate having an opening for providing an optical path extending between said first and second substrates for photo-coupling said two semiconductor elements to each other, and said light-emitting semiconductor element being coupled to at least two rigid electrodes having surfaces parallel to said parallel substrates of said supporting means, said rigid electrodes being electrically and mechanically connected at one of their parallel surfaces by solder to conductive interconnection layers exposed at predetermined positions of one of said paralllel substrates of said supporting means wherein said light-emitting semiconductor element comprises a light-emitting assembly including at least one pellet of a light-emitting element of a horizontally radiating type, and said rigid electrodes comprise a pair of block-like electrodes mounted on opposite surfaces of said pellet.

4,136,352
FIELD-EFFECT STRUCTURES

Paul C. Moutou; Pierre Gibeau, and Jean-Pascal Duchemin, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 8, 1976, Ser. No. 731,099
Claims priority, application France, Oct. 14, 1975, 75 31412
Int. Cl.[2] H01L *29/76*
U.S. Cl. 357—22 8 Claims

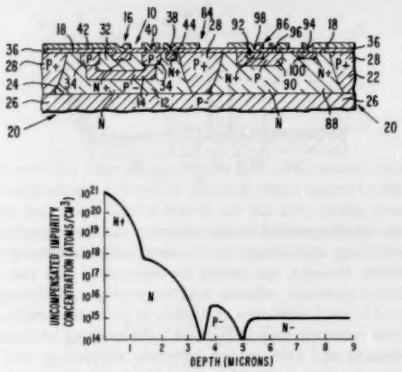


1. A junction type filed effect transistor comprising a semiconductive layer, a source and a drain electrode upon one and the same face of said layer a gate electrode forming a rectifying junction with said layer between said source and said drain and covering at least partly the other face of said layer, a dielectric layer, and a metal layer forming a substrate for said transistor and covering said other face and said dielectric layer.

4,136,353
BIPOLAR TRANSISTOR WITH HIGH-LOW EMITTER IMPURITY CONCENTRATION

Murray A. Polinsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 591,955, Jun. 30, 1975, abandoned. This application May 23, 1977, Ser. No. 799,722
Int. Cl.² H01L *29/72*
U.S. Cl. 357—34 **8 Claims**



1. In a semiconductor device having a collector region of one type conductivity, a base region of the opposite type conductivity disposed adjacent said collector region, and an emitter region disposed adjacent said base region away from said collector region and of said one type conductivity, said emitter region having a depth greater than about 0.5 micrometers and having a relatively high-impurity-concentration portion separated from said base region by a significantly lower-impurity-concentration portion disposed therebetween, said portions of said emitter region being separated from each other by a high-low junction characterized by a point of inflection in the profile of the logarithm of the impurity-concentration vs. depth, the emitter doping concentration at said point of inflection being less than 2×10^{18} atoms per cubic centimeter, said high-low junction being sufficient in depth to be effective, during operation of said device, as a barrier to reflect minority carriers from said base region, the improvement comprising:

said low-impurity-concentration portion having a graded impurity concentration therein with the lowest-impurity-concentration section thereof being disposed adjacent said base region.

4,136,354
POWER TRANSISTOR INCLUDING A SENSE EMITTER AND A REFERENCE EMITTER FOR ENABLING POWER DISSIPATION TO BE LIMITED TO LESS THAN A DESTRUCTIVE LEVEL

Robert C. Dobkin, Hillsborough, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 15, 1977, Ser. No. 833,519
Int. Cl.² H01L *29/72*
U.S. Cl. 357—36 **8 Claims**

1. A power transistor comprising

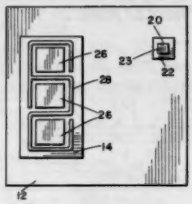
a base;

a power emitter in the base;

a sense emitter positioned in the base sufficiently close to the power emitter for enabling the temperature of the power emitter to be indicated as a function of the voltage across the junction of the base and the sense emitter; and

a reference emitter positioned in the base at a remote position that would not be heated by the heat dissipated by the power emitter for enabling the temperature at the remote position to be indicated as a function of voltage across the junction of the base and the reference emitter;

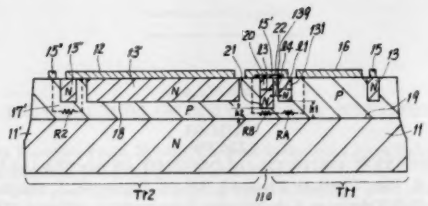
whereby a voltage difference proportional to the temperature gradient between the power emitter and the remote position induced by power dissipated in the power emitter can be sensed between the sense emitter and the reference emitter.



4,136,355
DARLINGTON TRANSISTOR

Kanji Mizukoshi, Takatsuski, and Goryo Hagio, Kusatsu, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Feb. 3, 1977, Ser. No. 765,426
Claims priority, application Japan, Feb. 10, 1976, 51-13451; Aug. 11, 1976, 51-96527; Nov. 2, 1976, 51-131931
Int. Cl.² H01L *27/02*
U.S. Cl. 357—46 **5 Claims**



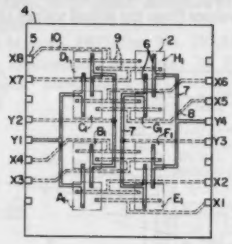
1. A semiconductor device forming a two stage amplifier comprising first and second transistors interconnected in such a way that the emitter of the first transistor is connected to the base of the second transistor, the collectors of both transistors are connected in common to a first terminal, the base of the first transistor coupled to a second terminal and through a first resistor to the emitter of the first transistor respectively, and the emitter of the second transistor coupled to a third terminal, and through a second resistor to the base of said second transistor, said semiconductor device including a monolithic substrate having a collector region of a first conductivity type and a base region of a second conductivity type, said collector region and base region forming a P-N junction therebetween, said base region having at least two emitter regions of said first conductivity type, said emitter regions being relatively disposed within said base region having a predetermined space therebetween, improved wherein:

one of said first and second resistors is formed by an obstruction region of said first conductivity type, disposed in said space between said emitter regions and extending into said base region to a depth deeper than the depth of said emitter regions, but shallower than said collector region, thereby forming a narrowed path under said obstruction region and one of said emitter regions, said path operating as said one resistor.

4,136,356
WIRING SUBSTRATE FOR A MATRIX CIRCUIT

Masaaki Kusano, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 12, 1977, Ser. No. 824,094
Claims priority, application Japan, Aug. 16, 1976, 51-97072
Int. Cl.[2] H01L 23/48
U.S. Cl. 357—70 7 Claims

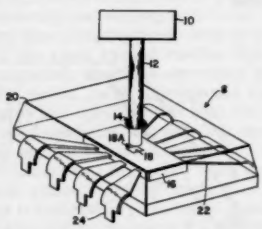


1. A wiring substrate for a matrix circuit including a plurality of semiconductor chips having incoming and outgoing electrodes in multi-chip configuration and incoming and outgoing lines to be connected to the electrodes of said semiconductor chips, comprising: incoming and outgoing line multi-wiring conductors for interconnecting the electrodes of said semiconductor chips associated with the same incoming and outgoing lines; incoming and outgoing line terminal electrodes; and conductor means for connecting said terminal electrodes with the middle portions intermediate the ends of the associated ones of said multi-wiring conductors.

4,136,357
INTEGRATED CIRCUIT PACKAGE WITH OPTICAL INPUT COUPLER

Thomas M. Frederiksen, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 3, 1977, Ser. No. 839,137
Int. Cl.[2] H01L 23/28, 27/14, 31/00
U.S. Cl. 357—72 10 Claims

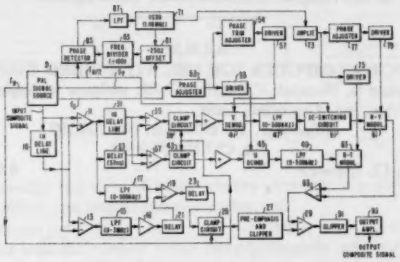


1. An integrated semiconductor structure comprising, in combination, an integrated circuit package, an integrated semiconductor device having external electrical connections mounted on said integrated circuit package, said integrated semiconductor device being electrically connected to said package, a clear dielectric encapsulant material located on said integrated semiconductor device and in contact with said package, and recess means located in one surface of said clear dielectric encapsulant material and within said clear dielectric encapsulant material for permitting coupling of light to said integrated semiconductor device a light coupling element having one end located in said recess means, said integrated semiconductor device having a light responsive device located directly beneath said recess means in said clear dielectric encapsulant material.

4,136,358
TRANSCODING APPARATUS

Jon K. Clemens, Skillman, and Michael D. Ross, Somerdale, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,295
Claims priority, application United Kingdom, Aug. 9, 1976, 33118/76
Int. Cl.[2] H04N 9/32, 5/79
U.S. Cl. 358—11 5 Claims



1. Transcoding apparatus, for use with a source of input composite color video signals including luminance signals and associated deflection synchronizing signals at respective line and field frequencies, and chrominance signals encoded in the PAL format and comprising modulated color subcarrier waves occupying a given band of frequencies, and accompanied by color synchronizing bursts of PAL subcarrier frequency; said transcoding apparatus comprising:

a source of output subcarrier waves of a frequency substantially corresponding to a given odd multiple of half said line frequency;

first comb filter means for subjecting said input composite signals to a first frequency response characteristic exhibiting a plurality of rejection notches at frequencies corresponding to respective odd multiples of half said line frequency;

a first low pass filter coupled to the output of said first comb filter means, and having a cutoff frequency below the lowest frequency in said given band and spaced above said output subcarrier wave frequency by a first frequency difference;

second comb filter means for subjecting said input composite signals to a second frequency response characteristic exhibiting a plurality of rejection notches at frequencies corresponding to respective even multiples of half said line frequency;

a second low pass filter coupled to the output of said second comb filter means, and having a cutoff frequency spaced below said output subcarrier wave frequency by a second frequency difference;

a delay line exhibiting a delay substantially corresponding to one period at said line frequency, and coupled to the output of said second comb filter means;

a delay device exhibiting a delay substantially corresponding to a quarter of a period at said PAL subcarrier frequency;

means for summing the outputs of said delay line and said delay device;

detector means, responsive to the output of said summing means, for developing a first color difference signal output, confined to frequencies less than each of said frequency differences;

means for subtractively combining the outputs of said delay line and said delay device;

detector means, responsive to the output of said subtractive combining means, for developing a second color difference signal output, confined to frequencies less than each of said frequency differences;

first modulator means for modulating subcarrier waves of a first phase, derived from said output subcarrier wave

source, in accordance with said first color difference signal output;

second modulator means for modulating subcarrier waves of a second phase, in quadrature relationship to said subcarrier waves of said first phase and derived from said output subcarrier wave source, in accordance with said second color difference signal output; and

means for combining the outputs of said first and second modulator means and said first and second low pass filters to form output composite color video signals.

4,136,359

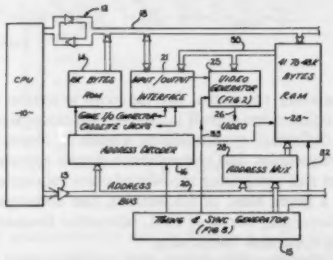
MICROCOMPUTER FOR USE WITH VIDEO DISPLAY

Stephen G. Wozniak, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 11, 1977, Ser. No. 786,197

Int. Cl.² H04N 9/44

U.S. Cl. 358—17 **8 Claims**



1. In a microcomputer for use with a video display an improved timing apparatus comprising:

a timing reference means for providing a color reference signal for said video display;

a horizontal synchronization means for providing horizontal synchronization signals for said display, said synchronization means coupled to said timing reference means for synchronization with said reference means such that said synchronization signals occur at an odd-submultiple of said color reference signal;

timing compensation means coupled to said timing reference means and said horizontal synchronization means for adjusting said horizontal synchronization signals such that said horizontal synchronization signals are in phase relationship with said color reference signal;

whereby the color graphics on a raster scanned cathode ray tube are sharply defined in the vertical direction.

4,136,360

APPARATUS INCLUDING A CIRCUIT ARRANGEMENT FOR ADJUSTING THE COLOR SIGNAL LEVELS OF A WHITE DOT

Ingo Hoffrichter, Kiel, and Hans-Georg Knop, Heikendorf, both of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Germany

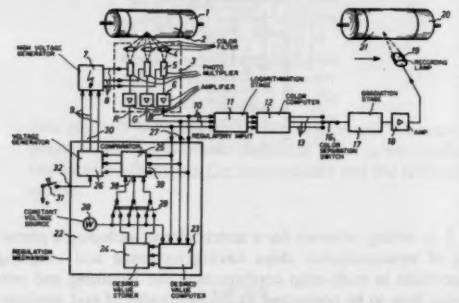
Filed Oct. 14, 1976, Ser. No. 732,404

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545961

Int. Cl.² H04N 1/40

U.S. Cl. 358—80 **5 Claims**

1. Apparatus for adjusting the color signal levels of a white dot in reproduction of color original pictures with a scanning means, in which for each color separation a photo-electric converter and amplifier are provided, the amplification factor of the converter and/or the amplifier is adjustable by a control signal, wherein for each color signal component of a color separation a comparator is provided, having an actual value input and a desired value input, said actual value inputs of the comparators comprise the color signal components, said desired value inputs of the comparators are connectable through a transfer switch to the setting means of a constant voltage source for the adjustment of the color signal components to a common level corresponding to the level of said constant voltage source, and said desired value inputs are connectable, for adjusting the color signal components to values necessary for producing a true color reproduction, to a storage device containing said necessary values, wherein a desired value computer supplying inputs to the storage device and calculating the desired values from the actual values of the color signal



components of the white dot and the white level, said computer is connected to the outputs of the amplifiers and to a constant voltage source, and wherein for each color signal component a voltage generator is provided, receiving the output of an associated comparator, each voltage generator during the adjustment of the color levels produces at its output a changing voltage as a control signal when unequal input values of the comparator exist, and, when the input values are equal locks onto and holds the instantaneous voltage value existing during reproduction.

4,136,361

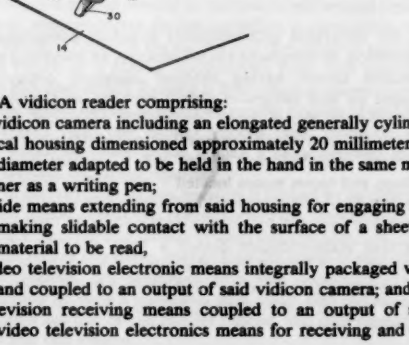
VIDICON READER

Duc Doan, 7814 S. San Pedro St., Los Angeles, Calif. 90003

Continuation-in-part of Ser. No. 704,521, Jul. 12, 1976. This application Jul. 27, 1977, Ser. No. 819,391

Int. Cl.² H04N 7/00, 5/30

U.S. Cl. 358—94 **3 Claims**



1. A vidicon reader comprising:

a vidicon camera including an elongated generally cylindrical housing dimensioned approximately 20 millimeters in diameter adapted to be held in the hand in the same manner as a writing pen;

guide means extending from said housing for engaging and making slidable contact with the surface of a sheet of material to be read,

video television electronic means integrally packaged with and coupled to an output of said vidicon camera; and

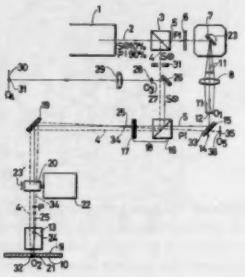
television receiving means coupled to an output of said video television electronics means for receiving and dis-

playing a visual display of characters viewed by the camera.

4,136,362
OPTICAL VIDEO PLAYBACK APPARATUS WITH TRACKING CONTROL AND TBC

Yohsuke Naruse, Tokyo; Masanobu Yamamoto, Yokohama, and Mikio Sugiki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,140
Claims priority, application Japan, May 20, 1976, 51-58307
Int. Cl.[2] H04N 5/76; G11B 21/10
U.S. Cl. 358—128 12 Claims



1. In an apparatus for optically reproducing information signals recorded in a record track on a record medium surface, which apparatus comprises light source means providing light beams for scanning along said track so as to read the information signals recorded therein and for tracking the scanning of the record track by the reading light beam, respectively, means directing said light beams in respective optical paths having portions incident on said record medium surface and portions reflected from said surface, objective lens means interposed in said optical paths for acting on said light beams in the incident and reflected portions of said paths, signal deflecting means responsive to the reading light beam in said reflected portion of its optical path for reproducing the recorded signals in said record track in response to scanning of said reading light beam along the track, and tracking servo control means responsive to each tracking light beam in the reflected portion of its optical path for positioning said reading light beam traversely in respect to the direction along the record track so as to maintain said scanning of the track by said reading light beam; the improvement comprising time base correction mirror means interposed in said optical paths adjacent said objective lens means for acting on said light beams in both the incident and reflected portions of said paths, said time base correction mirror means being angularly displaceable for positioning said beams in said direction along the record track, and said tracking servo control means including tracking control mirror means interposed in said optical paths between said source and said time base correction mirror means for acting on said light beams only in said incident portions of the optical paths, said tracking control mirror means being angularly displaceable for said positioning of the reading light beam transversely in respect to the direction along the track.

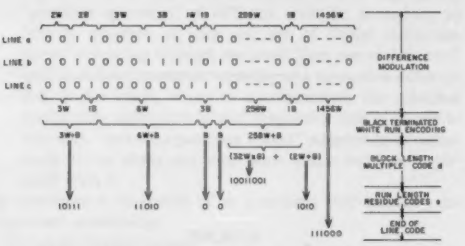
4,136,363
TRUNCATED RUN LENGTH ENCODING

Amitabh Saran, Cpyress, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1976, Ser. No. 756,664
Int. Cl.[2] H04N 1/40, 7/12
U.S. Cl. 358—261 10 Claims

1. In combination with raster scanning means for converting the information content of a subject copy into a binary video signal containing a predetermined number of serial picture elements for each of a plurality of successive scan lines and having black and white picture elements of opposite logic levels; the improvement comprising truncated run length encoding means including

run length dependent means for converting black terminated


DIFFERENCE MODULATION
BLACK TERMINATED WHITE RUN ENCODING
BLOCK LENGTH MULTIPLE CODE d
RUN LENGTH RESIDUE CODES e
END OF LINE CODE

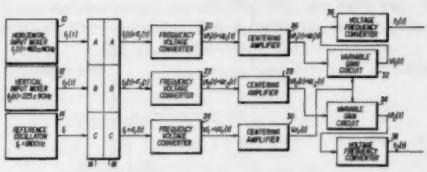
intra-scan line runs of white picture elements into corresponding run length message codes, and

run length independent means for converting unterminated intra-scan line runs of white picture elements into corresponding end of line message codes.

4,136,364
MULTI-STATE WOW AND FLUTTER REDUCTION SYSTEM AND METHOD

John C. Beery, Locust Grove; Harvey L. Huston, Fairfax, both of Va., assignors to Signature Systems, Inc., Springfield, Va.

Filed Jul. 1, 1977, Ser. No. 812,382
Int. Cl.[2] G11B 5/02
U.S. Cl. 360—28 9 Claims



1. A recording and reproducing system for recording vertical and horizontal positional information and for reproducing said positional information comprising;

recording and reproducing means including channel means A, B and C for simultaneously recording vertical and horizontal positional information signals $f_1(t)$ and $f_2(t)$ and a reference signal f_r in a respective channel means A, B and C, means for reproducing said information signals and reference signal to produce output signals $f_1(t) + \epsilon_1(t)$, $f_2(t) + \epsilon_2(t)$ and $f_r + \epsilon_r(t)$ having wow and flutter frequency errors $\epsilon_1(t)$, $\epsilon_2(t)$ and $\epsilon_r(t)$, respectively, introduced into said information and reference signals by said recording and reproducing means;

frequency to voltage converter means connected to said channel means for converting said output signals into frequency dependent voltages $Vf_1(t) + V\epsilon_1(t)$, $Vf_2(t) + V\epsilon_2(t)$ and $Vf_r + V\epsilon_r(t)$, in a respective one of said channel means A, B and C;

variable gain means connected to said frequency to voltage converter means for varying the gain of said frequency dependent voltage $V\epsilon_r(t)$ in a plurality of discrete voltage steps and for providing signals substantially equivalent to the error voltages $V\epsilon_1(t)$ and $V\epsilon_2(t)$, and for removing said error voltages $V\epsilon_1(t)$ and $V\epsilon_2(t)$ from said frequency dependent voltages $Vf_1(t) + V\epsilon_1(t)$ and $Vf_2(t) + V\epsilon_2(t)$, respectively, to provide frequency dependent voltages $Vf_1(t)$ and $Vf_2(t)$; and

voltage to frequency converter means connected to said variable gain means for converting said frequency dependent voltages $Vf_1(t)$ and $Vf_2(t)$ into output signals substan-

tially equivalent to said positional information signals $f_1(t)$ and $f_2(t)$.

4,136,365

MAGNETIC DISC STORAGE DEVICES HAVING COMPENSATION FOR DIMENSIONAL CHANGES

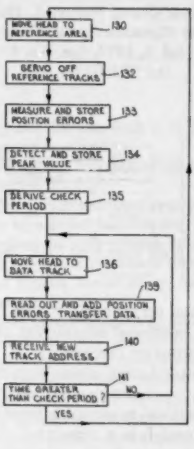
David M. Chick, Aldershot, and David B. Hawthorne, Windlesham, both of England, assignors to Data Recording Instrument Co. Ltd., Staines, England

Filed Jul. 6, 1977, Ser. No. 813,330

Claims priority, application United Kingdom, Jul. 6, 1976, 27972/76

Int. Cl.² G11B *21/08*

U.S. Cl. 360—78 **6 Claims**



1. A method of data transfer between a magnetic disc data storage device and a magnetic disc operatively coupled therewith, said device having a read-write head movable over the disc and position transducing means operative to produce a first position signal indicating the position of the head relative to the storage device; the method including repeatedly carrying out check cycles, each check cycle being carried out during an interruption in the transfer of data between the head and the magnetic disc, and each check cycle comprising moving the head until the position signal indicates that the head is aligned with an expected position, relative to the storage device, of a position reference on the magnetic disc; utilising the head to read a reference signal from the disc indicative of the position of the head relative to the position reference; deriving from the position signal and the reference signal an error signal representing the actual position of the position reference on the magnetic disc relative to the data storage device; storing the error signal and during a subsequent transfer of data between the head and a selected data track on the disc, the stored error signal is read out and utilised together with an address signal for the selected data track to position the head in alignment with said selected data track.

4,136,366

CASSETTE TAPE RECORDER AND METHOD FOR PRODUCING THE SAME

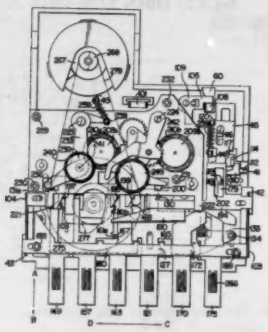
Kenji Ogiro, Yokohama; Shin Hashizume, Kamakura; Seii Miyakawa, Yokohama, and Masaya Kishi, Kamakura, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 6, 1977, Ser. No. 830,561

Claims priority, application Japan, Sep. 8, 1976, 51-106669; Jun. 22, 1977, 52-73225

Int. Cl.² G11B *15/28, 15/32*

U.S. Cl. 360—96 **6 Claims**



1. A cassette tape recorder comprising:

a. a fixed base plate formed on its upper surface with a plurality of position regulating members adapted to be juxtaposed against a plurality of portions of a tape cassette for regulating the attached position of the cassette, and formed therein with openings of an area large enough to permit a magnetic head and a pinch roller respectively to be inserted vertically from below the underside of the fixed base plate to extend through said openings for movement between positions in which the magnetic head and the pinch roller are inoperative and positions in which they are operative to perform recording and reproduction;

b. a head plate for vertically supporting said magnetic head assembled by being moved in a vertical direction toward the underside of the fixed base plate and mounted on the underside in such a manner that the head plate is capable of moving in sliding motion parallel to the underside and said magnetic head extend through said opening in the fixed plate to appear on its upper surface;

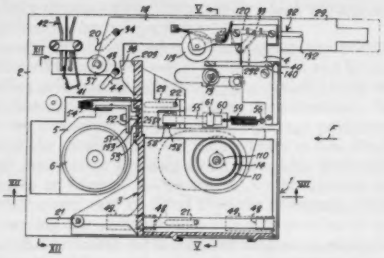
c. a pinch roller arm for supporting said pinch roller assembled by being moved in a vertical direction towards the underside of the fixed base plate and mounted at its base on the underside in such a manner that said pinch roller can move parallel to the base plate, said pinch roller extending through said opening in the fixed base plate to appear on its upper surface; and

d. an operating member assembled by being moved in a vertical direction towards the underside of the fixed base plate and mounted on the underside for moving said magnetic head and said pinch roller between their inoperative positions and operative positions, said operating member being connected to said head plate and said pinch roller arm and operative to move the head plate and the pinch roller arm on the underside of the fixed base plate when the recorder is rendered operative, so that the magnetic head and the pinch roller can move on and parallel to the upper surface of the base plate from their inoperative positions to their operative positions in which they are in contact with a tape in the tape cassette attached to the upper surface of the base plate.

4,136,367
APPARATUS FOR REPRODUCING AND/OR RECORDING MAGNETIC TAPE IN CASSETTES

Nardino Righi, Milan, Italy, assignor to Ri-El Ricerche Elettroniche S.p.A., Cologno Milanese, Italy

Filed May 24, 1977, Ser. No. 800,118
Claims priority, application Italy, May 25, 1976, 12643 A/76
Int. Cl.[2] G11B *15/24*
U.S. Cl. 360—96 **1 Claim**

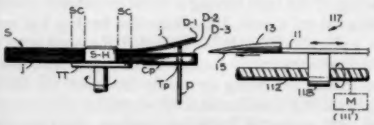


1. An apparatus for reproducing and/or recording magnetic tape in cassettes comprising, in combination, a fixed frame plate, a cassette receptacle for carrying a cassette supported on said frame plate for horizontal sliding movement in the direction of introduction and expulsion of the cassette in the receptacle, a carrier plate having a tape transport mechanism mounted thereon supported on said receptacle for both sliding movement therewith and for vertical movement towards and away from said receptacle, a strip of flexible material connected at one end to said frame plate and at the other end to said carrier plate, a guide roller mounted on said receptacle for sliding engagement with said flexible strip to effect a movement of said carrier plate towards said receptacle during the introduction of said cassette into said receptacle for engagement of said tape transport mechanism with said cassette and means connected to said carrier plate and said receptacle for yieldingly urging said carrier plate away from said receptacle.

4,136,368
THROUGH-PARTITIONING OF PORTABLE FLEXIBLE DISK PACK AND ASSOCIATED APPARATUS

Dean L. DeMoss, Camarillo, and Herbert U. Ragle, Thousand Oaks, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 711,628, Aug. 4, 1976. This application Sep. 7, 1976, Ser. No. 720,905
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] G11B *23/02, 25/04*
U.S. Cl. 360—98 **9 Claims**



1. In a data storage system including a portable partitionable pack of flexible disks, this pack comprising:

a plurality of like flexible circular recording disks, each including at least one planar recording surface, the disks being formed and arranged in a concentric stack so that the stack is "partitionable end-wise" and normal to said recording surface rather than "edge-wise" or from the side of the pack;

each said disk of said stack having a central bore for engaging disk pack rotation means and an encoded arrangement of "partition apertures" provided about at least part of a common arcuate segment relatively concentric with the disk center;

the disks being attached together adjacent this central bore and being formed and stacked so that these segments register and so that predetermined, of said superposed "partition apertures" of different disks lie in registry to thereby generate at least one set of "blind deflection bores" extending through the stack from one end thereof, each such bore in a set terminating at a respective different disk in the stack, so as to accommodate the selective partitioning deflection of said respective disk in cooperation with "end-wise partition means" adapted to be selectively thrust along any such bore which has been registered with it;

the combination therewith of an automatic disk handling arrangement comprising:

disc pack rotation means;

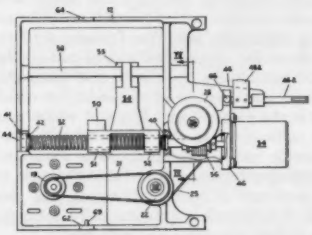
transverse thrust means, arranged and adapted to be automatically thrust up at least a selected one of these blind deflection bores to thereby effect said "end-wise partition"; and

select control means adapted to control said rotation means so as to register said thrust means with the selected deflection bore, said thrust means being operatively related with said control means and controlled thereby to invoke each such partitioning thrust.

4,136,369
DISC RECORDER WITH LEAD SCREW DRIVE

Samuel A. Morgan, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 531,246, Dec. 1, 1974, abandoned, which is a division of Ser. No. 418,299, Nov. 23, 1973, Pat. No. 3,913,137. This application Feb. 6, 1976, Ser. No. 655,970
Int. Cl.[2] G11B *21/08, 5/55*
U.S. Cl. 360—106 **7 Claims**



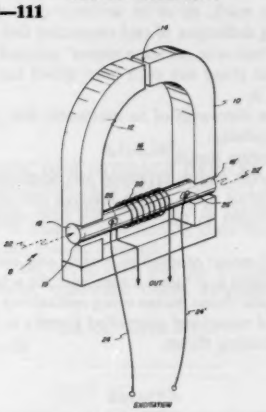
1. In a data recorder/reproducer device, of the type using a disc-form recording media and having a transducer and a lead screw and follower apparatus for moving the transducer across the recording disc, the improvement wherein said device has a rigid main support frame mounting component parts of the device, said parts including said lead screw and a motor-driven hub for engaging and rotating said disc, said frame having a pair of mutually spaced and oppositely-aligned means for supporting said lead screw in position at widely-spaced points relative to the length of the lead screw, said points spaced apart sufficiently to support the lead screw near its opposite end extremities; bearing means for said lead screw, disposed at at least a first one of said screw-supporting frame points, and means at said first frame point for holding said bearing means in place against lateral movement in at least one direction; said bearing means including a portion engaging said lead screw and holding it from shifting longitudinally in at least said one direction; means for continuously resiliently loading said screw endwise along a major portion of length axially from the other of said screw-supporting frame points and against said bearing means to resiliently hold the lead screw from shifting longitu-

dinally away from said bearing means; and drive motor means coupled to said lead screw to rotate the latter.

4,136,370
MAGNETIC FILM SENSOR

Charles R. Moeller, Cardiff-by-the-Sea, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,108
Int. Cl.[2] G11B *5/34*
U.S. Cl. 360—111 **1 Claim**



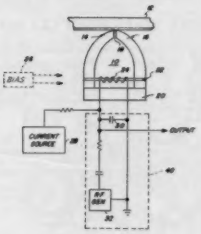
1. In a magnetic head adapted to produce a signal corresponding to a sensed level of magnetic flux, comprising:
(a) first and second magnetic pole pieces, and means structurally cooperating with said pole pieces so that they define a non-magnetic transducer gap therebetween;
(b) an elongated electrical conductor secured to and extending between the pole pieces remote from said transducer gap, said conductor having a thin single domain film of magnetic material coated thereon and substantially coextensive therewith, said film forming a closed magnetic path about the longitudinal axis of said conductor; and
(c) a coil inductively coupled to said conductor, said thin film having an easy axis of magnetization which is substantially in the plane of said film and which axis is substantially orthogonal to the length of said conductor, said conductor being adapted to have a current having an alternating component passed therethrough, whereby said coil produces a modulated signal, the modulation of which corresponds in a substantially linear manner to the level of flux traversing said pole pieces,
the improvement wherein a pair of electrical leads are connected to said conductor at respective opposite sides of said coil, such connections being respectively between said pole pieces and said coil, and being substantially magnetically isolated from said pole pieces and said film, thereby to preclude magnetic saturation of said pole pieces.

4,136,371
MAGNETIC HEAD EMPLOYING HARD AXIS THIN FILM INDUCTOR

Charles R. Moeller, Cardiff-by-the-Sea, Calif., assignor to Eastman Technology, Inc., Rochester, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,105
Int. Cl.[2] G11B *5/34*
U.S. Cl. 360—111 **6 Claims**

1. Magnetic head apparatus comprising:
(a) first and second magnetic pole pieces disposed to form a transducer gap therebetween;
(b) means supporting an essentially single domain unidirectional magnetic film magnetically coupled to said pole pieces for completing a magnetic circuit comprising said pole pieces, said gap, and said film, said film being so disposed with respect to said pole pieces that flux entering said transducer gap traverses said film substantially in the direction of the hard axis of said film;
(c) a coil inductively coupled to the hard axis of said film;
(d) means for applying a magnetic bias along the hard axis of said film in order to effect a quiescent inductance for said coil, and

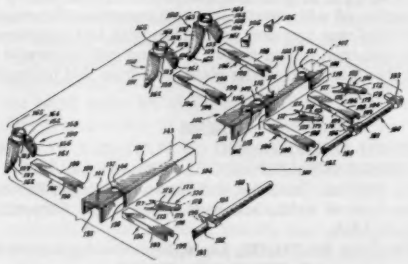


(e) means coupled to said coil for detecting inductance variation thereof as caused by flux variations sensed by said gap,
whereby flux entering said transducer gap correspondingly causes the inductance of said coil to vary detectably.

4,136,372
PROTECTIVE BOOT FOR A HIGH VOLTAGE CIRCUIT INTERRUPTER

Reginald O. Oak, 230 Somerset Ave., Fairfield, Conn. 06430

Filed Mar. 11, 1977, Ser. No. 776,584
Int. Cl.[2] H02B *1/14;* H01H *31/02;* H01B *17/56*
U.S. Cl. 361—131 **5 Claims**



1. A multipart protective boot adapted for installation on an existing voltage circuit interrupter to insulate the grounded portions thereof against bridging contact with the high voltage conducting portions thereof caused by squirrels, other small climbing animals or foreign objects, the high voltage interrupter being of the type having a metal crossbeam attached to and supported on a pole, the crossbeam having top and side surfaces, a plurality of switches mounted at spaced apart points on the crossbeam, each switch including a first insulator mounted to and extending upwardly from the top surface of the crossbeam, the first insulator surrounding a nonconductive rotatable rod, a switch blade mounted to the rotatable rod adjacent the upper end of the first insulator opposite the crossbeam, a second insulator mounted to a side of the crossbeam via a metal support bracket having a top plate and depending legs, the legs connected to the crossbeam and the second insulator positioned in a circular tub of the top plate, the second insulator being angled away from the first insulator, a metal brace mounted to the top of the second insulator and supporting a switch contact positioned to receive the switch blade and thereby close the switch, and a metal operating lever attached to the rotatable rod between the first insulator and the crossbeam, the operating lever connected to a control pipe by a

pivotal connector whereby the control pipe is connected to the operating levers of all of the plurality of switches thereby causing the rotatable rods to rotate together and the switches to open and close together, wherein one of the switches is a master switch characterized by crank means connected to the lower end of its rotatable rod under the crossbeam for rotating its rotatable rod to open and close the master switch and the other switches, the multipart protective boot being fabricated out of a flexible nonconductive material of sufficient thickness to prevent burn-through when contacted by a high voltage, the multipart protective boot comprising:

(A) a crossbeam cover having a rectangular top portion dimensioned to cover the top of the crossbeam and having depending side portions extending downwardly from the top portion for covering the sides of the crossbeam, the top of the crossbeam cover defining openings positioned to permit the rotatable rods of the switches to pass therethrough and further defining a slot extending from each opening to an edge of the crossbeam cover wherein the crossbeam cover may be fitted over the crossbeam without removing the switches, and one side portion of the crossbeam cover defining slots positioned for passing the legs of the metal support brackets for the second insulators of the switches therethrough;

(B) a support cover for each of the metal support brackets supporting the second insulators of the switches, the support cover being fabricated out of a single piece of the nonconductive insulating material which is doubled over to form a continuous fold and having top plate cover and leg coverings extending from the fold to flank and cover the top plate and legs of the metal support bracket thereby defining a slot opposite said fold permitting the support cover to be slippled over the metal support bracket, the top plate cover further defining an opening surrounded by an upstanding circular wall for surrounding the circular tub, and the support cover defining a slot to its edge permitting the support cover to be installed without removing the second insulator;

(C) an operating lever cover for each operating lever, the operating lever covers being hollow and having a top and bottom longitudinally connected by a pair of rounded sides and having a semicircular cutout at one end which extends through the top and bottom for conforming to the adjacent first insulator and the bottom having a connector opening for accommodating the pivotal connector to the control pipe, the operating lever cover defining a longitudinal slot which extends along its bottom between the connector opening and the semicircular cutout to permit the operating lever cover to be fitted over the operating lever;

(D) a control pipe cover comprising a tube having a longitudinal slot extending along its entire length permitting it to be fitted over the control pipe, the control pipe cover having enlarged portions positioned for accommodating and substantially covering the pivotal connectors.

4,136,373
BULK TAPE ERASER

Raymond E. Amos, Exeter, England, assignor to Amos of Exeter Limited, Exeter, England

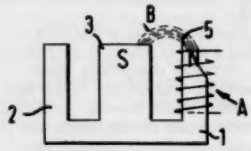
Filed May 9, 1977, Ser. No. 794,891

Claims priority, application United Kingdom, May 28, 1976, 22374/76

Int. Cl.[2] H01F *13/00*

U.S. Cl. 361—151 **2 Claims**

1. A bulk tape eraser for erasing magnetic tape in bulk form, comprising an E-shaped magnet built up of laminations of magnetic material having a central limb and two outer limbs, said three limbs having free ends which are substantially colinear, said outer limbs extending substantially parallel to one another and to said central limb, and an energizing coil surrounding one of said two outer limbs, the outer edge of said one of said outer limbs being chamfered at the free end of said limb toward the inner edge of said limb at an angle between 55° and 65° to leave said limb with a narrow free end having a width equal to about one fifth of the width of the unchamfered portion of said limb, whereby magnetic flux from said one of said outer limbs is directed substantially entirely to said central



limb and produces a magnetic field of high intensity which extends in an arc through a region between and above the free ends of said one outer limb and said central limb through which region a bulk tape may be passed for erasure.

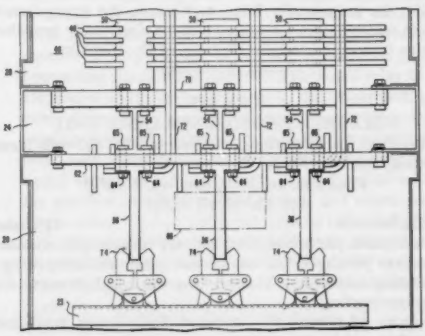
4,136,374
ELECTRICAL SWITCHBOARD APPARATUS INCLUDING DOUBLE-FLANGED VERTICAL RISER CONDUCTORS

Richard Rosey, Plum Borough; George N. Kovatch, Monroeville Borough; Nicholas A. Tomasic, Plum Borough, all of Pa., and Ned H. Simon, Queeny Township, St. Louis County, Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 30, 1976, Ser. No. 756,036

Int. Cl.[2] H02B *1/00, 1/20*

U.S. Cl. 361—342 **18 Claims**



1. Electrical power distribution switchboard apparatus, comprising:

a cabinet structure having a device compartment, a bus compartment, and a barrier separating said compartments;

a horizontal main bus disposed within said bus compartment and adapted for connection to a source of electrical power;

a vertical distribution riser bus comprising a vertical conductor disposed within said bus compartment and connected to said horizontal main bus;

fixed line side connector members connected directly to said vertical conductor, said connector members extending into said device compartment and adapted for sliding electrical contact with associated circuit interrupter devices;

retainer means fixedly attached to said vertical conductor; and

fastener means completely insertable and removable from said device compartment and extending through said connector members to engage said retainer means, thereby securing said connector members to said vertical conductor to provide direct electrical contact therebetween.

4,136,375

SHIELD CONNECTION IN PHOTOFLASH ARRAY

Norman E. Kewley, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,732
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—10 7 Claims

1. A multiple flash lamp array comprising a plurality of flash lamps each having a pair of lead-in wires extending therefrom, a circuit board, circuitry comprising circuit runs carried by said circuit board for sequentially firing said lamps, and a sheet-like conductive shield member positioned substantially parallel to one side of said circuit board, said lead-in wires of the lamps being embedded in said circuit board and in contact with respective ones of said circuit runs, the end of one lead-in wire of at least one of said pairs thereof extending from said side of the circuit board and in contact against said shield member.

4,136,376

PHOTOFLASH LAMP ARRAY CIRCUIT BOARD HAVING ELECTRICAL INSULATION

David H. Green, Mattoon, Ill.; Edward J. Collins, Mentor-on-the-Lake, and Vaughn C. Sterling, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 751,537, Dec. 16, 1976. This application Oct. 19, 1977, Ser. No. 843,589
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—10 8 Claims

1. In a circuit board for a photoflash lamp array having lamp firing circuitry thereon to fire a plurality of flash lamps electrically connected thereto and switch devices connected in said circuitry for sequentially firing said lamps, the improvement wherein said switches are coated with an electrically insulative adhesive coating to prevent shorting of the circuitry.

4,136,377

FOLDABLE PHOTOFLASH LAMP UNIT

Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Feb. 16, 1978, Ser. No. 878,270
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 11 Claims

1. A foldable photoflash lamp unit for substantially eliminating red-eye photographic results, said lamp unit comprising:

a housing including a base portion and a light-transmitting cover portion;

an array of electrically-activated flash lamps positioned within said housing; and

elongated coupling means including a body portion and a mounting device at a first end of said body portion for mounting atop or within a camera, said coupling means adapted for transmitting flash-activating signals from said mounting device to each of said flash lamps within said housing, said housing pivotally oriented on said coupling means and adapted for occupying first and second positions relative thereto, said flash-activating signals passing through the location of said pivot when said housing occupies said first position.

4,136,378

PHOTOFLASH LAMP ARRAY HAVING REFLECTOR AT REAR OF TRANSPARENT CIRCUIT BOARD

Harihar D. Chevali, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,607
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 6 Claims

1. A photoflash lamp array comprising a plurality of flash lamps, a circuit board carrying circuitry for sequentially firing said flash lamps, said flash lamps being positioned over the front surface of said circuit board and connected electrically to said circuitry, said circuit board being made of an electrically insulative light-transmitting material, and a sheet-like reflective member positioned immediately behind said circuit board and which functions as a reflector of light from said lamps when flashed.

4,136,379

PHOTOFLASH LAMP ARRAY HAVING REFLECTIVE CIRCUIT BOARD

Harihar D. Chevali, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,608
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 6 Claims

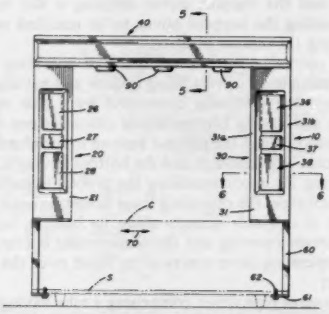
1. A photoflash lamp array comprising a plurality of flash lamps, and a circuit board carrying circuitry for sequentially firing said flash lamps, said flash lamps being positioned over a surface of said circuit board and connected electrically to said circuitry, said circuit board being made of an electrically insulative light-reflecting material, said surface of the circuit board functioning as a reflector of light from said lamps when flashed.

4,136,380

COUNTER TOP DISPLAY UNIT

Jerry Shaw, 50 W. Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Rd., both of Akron, Ohio 44313

Filed Mar. 28, 1977, Ser. No. 781,569
Int. Cl.[2] F21V *33/00*; A47B *77/08*
U.S. Cl. 362—145 5 Claims



1. A display unit for use on a supporting counter, comprising:

(A) opposed pedestals each having top and bottom ends and display surfaces disposed intermediate said ends;

(B) an elongate, box-like canopy having a planar bottom panel;

(C) said top ends of said pedestals being attached to said bottom panel of said canopy adjacent its ends;

(D) said bottom ends of said pedestals being supported on the top of the supporting counter;

(E) attachment means carried by each of said pedestals for releasable engagement with the supporting counter;

(F) a top plate received on the top ends of each of said pedestals;

(G) said bottom panel of said canopy having at least one elongate slot therein extending along the longitudinal axis thereof and disposed adjacent each of its opposed ends; and

(H) at least one threaded stud carried by each of said top plates and extending through said slots in said bottom panel of said canopy.

4,136,381

DC TROUBLE LAMP

Everett W. Bone, 2206 Melbourne Ct., Fort Wayne, Ind. 46804

Filed Jun. 2, 1977, Ser. No. 802,796
Int. Cl.[2] F21V *3/00*
U.S. Cl. 362—311 6 Claims

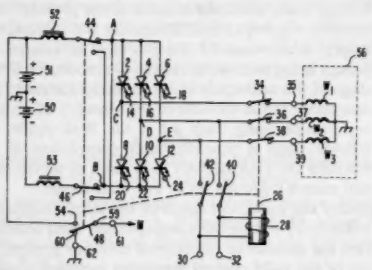
1. A DC trouble lamp comprising:
a housing having a handle portion,
an electric light bulb socket in said housing having a direct current light bulb received therein,
a curved translucent shade connected to said housing and being positioned behind said bulb, said shade being of a highly visible color,
a protective cage being positioned in front of said bulb,
a hook secured to said lamp,
a power cord electrically connected to said socket for supplying electric current thereto,
a pair of heavy gauge insulated electrical leads each terminating in a spring biased, manually operated battery terminal clamp at one end thereof,
first and second cooperating separable connectors electrically connected respectively to one end of said power cord and to the free ends of said leads, said connectors including means for positively locking them together,
said power cord being of a substantially lighter gauge and of a substantially longer length than said leads, and
selectively operable flasher means in said housing for periodically interrupting the supply of electric current to said light bulb.

4,136,382

CONVERTER SYSTEM

Ronald L. Ricci, Madison, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 18, 1978, Ser. No. 870,515
Int. Cl.[2] H02M *7/757*
U.S. Cl. 363—137 16 Claims



1. A conversion system operable to a first condition for inverting a DC voltage from a battery to a three-phase AC output voltage, and operable to a second condition in response to a single-phase AC voltage, for rectifying the single-phase AC voltage to a DC voltage for charging the battery, said system comprising:
a mode terminal where a mode signal is produced;
said battery having a positive terminal and a negative terminal;
first and second input terminals for receiving a single-phase AC voltage;
first through third output terminals where first, second and third phases, respectively, of said three-phase AC output voltage are developed;
a reference terminal for receiving a source of reference potential;
first through sixth solid-state switches, each having a control electrode receptive of a control signal, and a main current conduction path between first and second electrodes having a relatively high impedance in the presence of a low-level control signal, and a relatively low impedance in the presence of a high-level control signal, the second electrodes of said first through third switches being individually connected to the first electrodes of said fourth through sixth switches, respectively;
an AC relay having an operating coil connected across said first and second input terminals, first through third normally-closed single-pole-single-throw switch contacts connected between said first through third output terminals and the common connections between said first and fourth, second and fifth, and third and sixth solid-state switches, respectively, first and second normally-open single-pole-single-throw switch contacts connected between said first and second input terminals and the common connections of said second and fifth, and third and sixth solid-state switches, respectively, a first single-pole-double-throw switch having a pole connected to the positive terminal of said battery, a normally-closed contact connected in common to the first electrodes of said first through third solid-state switches, and a normally-open contact connected in common to the second electrodes of said fourth, fifth and sixth solid-state switches, a second single-pole-double-throw switch having a pole connected to the negative terminal of said battery, a normally-closed contact and a normally-open contact connected individually to the normally-open and normally-closed contacts, respectively, of said first single-pole-double-throw switch, and a third single-pole-double-throw switch having a pole connected to said mode terminal, a normally-open contact connected to the positive terminal of said battery, and a normally-closed contact connected to said reference terminal; and
controller means for producing first through sixth control signals for operating said first through sixth solid-state switches, respectively, whereby whenever said single-phase AC voltage is applied between said first and second input terminals, said coil of said AC relay is energized for connecting the poles of said switches of said relay to their respective normally-open contacts, and disconnecting the poles from their associative normally-closed contacts, causing said mode signal to be at said reference potential level, said controller means being responsive to said mode signal at this time for operating said solid-state switches for said first condition of said system, and whenever said single-phase AC voltage is not applied between said first and second input terminals, said relay is de-energized with its switches being returned to their "normal" states, said controller means is responsive to said mode signal having a positive voltage level at this time for operating said solid-state switches for said second condition of said system.

4,136,383

MICROPROGRAMMED, MULTIPURPOSE PROCESSOR HAVING CONTROLLABLE EXECUTION SPEED

Masaru Takesue, Higashikurume, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 616,576, Sep. 25, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 778,566
Claims priority, application Japan, 1974, 49-112984
Int. Cl.[2] G06F *7/38, 9/16*
U.S. Cl. 364—200 9 Claims

1. A multipurpose speed controllable processor comprising:
a plurality of control memories (CM's) for storing microprograms including micro instructions comprising operand addresses and operation codes;
a plurality of register groups (REG's) for storing the micro instructions, as well as data and the internal states of the processor;
a plurality of arithmetic-logic units (ALU's) for executing the microinstructions;
a control unit;
a first switch means (SW-R) for transferring operand ad-

dresses from said plurality of control memories to said plurality of register groups;

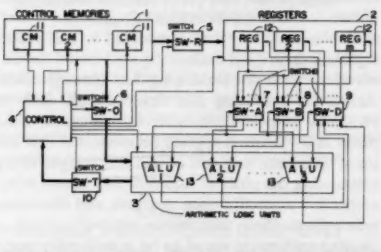
a second switch means (SW-A, SW-B) for transferring information from said plurality of register groups to said plurality of arithmetic logic units;

a third switch means (SW-D) for transferring the results of operations from said plurality of arithmetic-logic units to the plurality of register groups;

a fourth switch means (SW-O) for transferring operation codes from said plurality of control memories to said plurality of arithmetic-logic units;

a fifth switch means (SW-T) for transferring the special status (+, −, 0, overflow, etc.) of the results of the operations in said plurality of arithmetic-logic units to said control unit;

said control unit comprising means for controlling the execution of the microprograms by reading out the micro instructions making up the microprograms from the plurality of control memories, for transferring via the first switch means (SW-R) to the plurality of register groups a first address (A-address) and a second address (B-address) selected from three operand addresses (A-address, B-address and D-address) designated in the microinstructions, for reading out two input operands from the plurality of register groups in accordance with the first and



second addresses, for transferring the two input operands to the plurality of arithmetic-logic units via the second switch means (SW-A, SW-B) and for transferring via the fourth switch means (SW-O) to the plurality of arithmetic-logic units operation codes designated in the read out micro instructions to execute the operations, for transferring the results of the operations to the plurality of register groups via the third switch means (SW-D) and for transferring the third address (D-address) to the plurality of register groups via the first switch means (SW-R) for writing the transferred operation results in the plurality of register groups in accordance with the transferred third address (D-address), for receiving via the switch (SW-T) information indicative of the special status of the results of the operations in the plurality of arithmetic-logic units, and for controlling a series of stages for determining addresses of micro instructions to be read out in the next cycle in accordance with the received special status information and addresses designated in the read out micro instructions;

said control unit further comprising means for dividing said plurality of control memories into valid control memories and invalid control memories; means for dividing the valid control memories (S) into a plurality (n) of control memory groups (CG_1, $CG_2 \ldots CG_n$), each group respectively including an arbitrary number

$$(s_1, s_2, \ldots s_n, \sum_{i=1}^{n} s_i = S)$$

of valid control memories; means for allocating an arbitrary number

$$(t_1, t_2, \ldots t_n, \sum_{i=1}^{n} t_i = T_0 = T)$$

of the plurality of arithmetic-logic units (T) to each group of the plurality of control memory groups; means for subdividing the valid control memories forming an arbitrary group (CG_i, $1 \leqq i \leqq n$) of the plurality of control memory groups into a plurality (q) of control memory sub-groups (sub-CG_{i1}, sub-CG_{i2}, ... sub-CG_{iq}), each control memory sub-group including an arbitrary number of control memories

$$(r_{i1}, r_{i2}, \ldots r_{iq}, \sum_{j=1}^{q} r_{ij} = s_i, q = q(i) \geqq t_i);$$

and means for setting one of either Go-On mode or a Wait mode of operation for each of the plurality of control memory groups;

wherein, in accordance with the operation of said last mentioned five means, a control memory is selected from a control memory sub-group of each of the plurality of control memory groups at the same time, and one micro instruction is read out of each of the selected control memories at the same time (CM-READ stage); the read-out micro instructions are simultaneously executed in the (t_i) arithmetic-logic units allocated to that control memory group, the number of micro instructions simultaneously executed being equal to the number (t_i) of arithmetic-logic units allocated to that control memory group (EXECUTION stage); upon completion of the execution of all of the read out micro instructions, addresses of micro instructions to be read out in the next cycle are determined corresponding to the plurality of control memory sub-groups in accordance with the address parts of the read out micro instructions and the special status information of the results of the operations in the arithmetic-logic units allocated to each of the plurality of control memory groups (ADDRESS DETERMINATION stage); in the case of the plurality of control memory groups being each set in the Go-On mode, the CM-READ stage of the next cycle is immediately started to repeat its operation; and in the case of the plurality of control memory groups being each set in the Wait mode, the CM-READ stage is repeated after completion of the ADDRESS DETERMINATION stage of all the other control memory groups set in the Wait mode;

whereby the execution speed of the microprograms is controllable by setting the number of the valid control memories, the number of the control memory groups, the number of the valid control memories included in each of the control memory groups, the number of the control memory sub-groups, the number of the control memories included in each of the control memory sub-groups, the number of arithmetic-logic units allocated to each of the control memory groups and the mode of operations of each of the control memory groups.

4,136,384

LOOP TYPE DATA HIGHWAY SYSTEM

Masakazu Okada; Jushi Ide; Selichi Yasumoto, and Hitoshi Fushimi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 24, 1977, Ser. No. 781,020
Claims priority, application Japan, Mar. 29, 1976, 51-33662
Int. Cl.[2] G06F 3/04
U.S. Cl. 364—200 **5 Claims**

1. A loop type data highway system comprising a plurality of stations connected in series in a loop transmission line for transmission of information in the form of bits from one of said stations selected as a transmit station to another one selected as a receiving station, each of said stations comprising

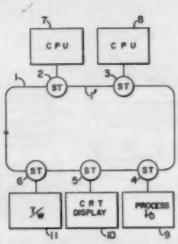
(a) means for memorizing information to be transmitted in

the form of bits when said each station is selected as the transmit station,

(b) means for transmitting a data frame including at least said information and an end signal indicating the end of said data frame to a station next to said each station when said each station is selected as the transmit station,

(c) means for passing the data frame received from a preceding station to the next station except when said each station is selected as the transmit station,

(d) means for making a comparison check when said each station is selected as a transmit station by comparing said memorized information with the information included in the data frame, which has been transmitted from said each station, passed through the remaining stations and then



returned to said each station, on a predetermined number of bits by bits basis successively and for producing an error signal immediately when said bits-by-bits comparison indicates non-coincidence between them,

(e) means responsive to said error signal to cause said each station to interrupt transmission of said information and transmit the end signal when said each station has been selected as a transmit station, and

(f) means for receiving the data frame transmitted from the preceding station when said each station is selected as the receiving station and determining that the information included in said received data frame includes error when the end signal is received prior to receiving a predetermined number of bits of said information.

4,136,385
SYNONYM CONTROL MEANS FOR MULTIPLE VIRTUAL STORAGE SYSTEMS

Patrick M. Gannon, Poughkeepsie; Andrew R. Heller, Mohegan Lake, and Ronald M. Smith, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1977, Ser. No. 781,022
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **9 Claims**

1. Shareable page control means for a data processing system, which can have pages in different address spaces which can have the same virtual addresses, the address spaces being identified by respective segment tables, control register means identifying an active segment table, and a virtual address register for containing a virtual address to be accessed in the address space of the active segment table, comprising

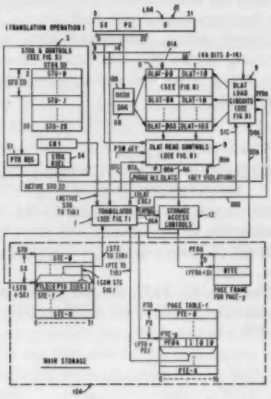
a dynamic look-aside array having a plurality of buffer entry units called DLATs, each DLAT having fields for containing a virtual and a real address for a page, and also having a field for identifying a segment table associated with any page address in the DLAT,

DLAT addressing means for receiving selected bit positions of the virtual address register to generate a DLAT address for selecting a subset of the DLATs in the array, each subset having at least one DLAT,

address translation means for translating a virtual address in the virtual address register into a real address by accessing a segment table entry (STE) in the active segment table and accessing therefrom a page table entry (PTE) to obtain a page frame address,

a share control field being provided in each STE for indicating the shareablility of all pages referenced by the STE,

DLAT loading means for loading into a selected DLAT a direct or indirect address of the active segment table, a virtual address of a page from the virtual address register, and a page frame address from the address translation means,



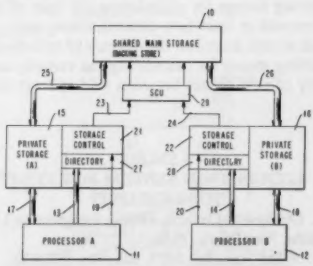
share control means with the address translation means for sensing the state of the share control field in the STE and being connected to the DLAT loading means for loading the selected DLAT with a signal indicating the state of a sensed share control field,

whereby a share control signal in any DLAT can signal if a page addressed by the DLAT is to be shared by plural address spaces or if the page is to be restricted to the address space of the segment identified in the DLAT.

4,136,386
BACKING STORE ACCESS COORDINATION IN A MULTI-PROCESSOR SYSTEM

Eugene J. Annunzinta, Cary, N.C.; Robert S. James, Pleasant Valley, and Kwang G. Tan, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1977, Ser. No. 840,070
Int. Cl.[2] G06F *9/18, 13/00*
U.S. Cl. 364—200 **13 Claims**



1. For use in a data processing system which includes at least two processors, each with an associated cache, and a backing store shared by all said processors; a system control unit for coordinating backing store access requests by said processors, said system control unit comprising:

cross-interrogate means responsive to a data access request

from one of said processors to produce a first signal if the requested data is in the cache associated with another processor;

queueing means for temporarily storing a plurality of data access requests;

means responsive to said first signal for causing the processor associated with the cache containing the requested data to initiate a store operation of said data into the backing store;

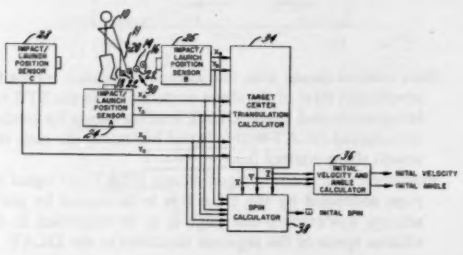
means preventing access to said requested data in said backing store until the store operation initiated by said another processor has been completed; and

sequence control means, associated with said queueing means, causing access requests related to said requested data to be issued from said queueing means in a first-in-first-out sequence.

4,136,387
GOLF CLUB IMPACT AND GOLF BALL LAUNCHING MONITORING SYSTEM

Paul F. Sullivan, Acushnet; Francis deS. Lynch, Mattapoisett; William Gobush, North Dartmouth, and Hoyt C. Hottel, Jr., Mattapoisett, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 12, 1977, Ser. No. 832,564
Int. Cl.[2] G06G *7/48*; A63B *43/00*
U.S. Cl. 364—410 **12 Claims**



1. Apparatus for evaluating translational and rotational motion of at least one sports object comprising:

(a) at least two electro-optical monitoring means;

(b) means for optically enhancing at least one point on said object;

(c) said electro-optical monitoring means each providing an output at at least two discrete times, said output from each electro-optical monitoring means being related to the position within the field of view of each electro-optical monitoring means of said at least one point;

(d) first means, employing the outputs of said electro-optical monitoring means for calculating the spin of said object between said at least two discrete times; and

(e) second means, based on the outputs of said electro-optical monitoring means for calculating the velocity and angle of velocity of said object between said at least two discrete times.

4,136,388
DATA ACQUISITION SYSTEM FOR COMPUTED TOMOGRAPHY

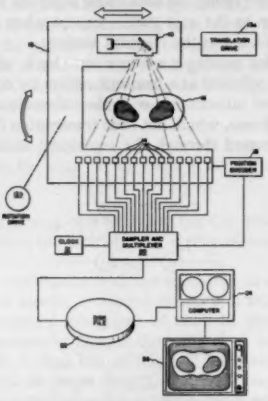
Thomas R. Lindquist, Oxford, Conn., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1977, Ser. No. 827,932
Int. Cl.[2] G01N *23/00*
U.S. Cl. 364—414 **16 Claims**

1. A method for producing radiation transmission data signals in a computed tomography system of the type wherein one or more radiation source and detection units move about a body undergoing examination with velocity profiles which may vary with time; comprising the steps of:

sampling and storing radiation detector output signals and detector position signals from each of said detectors at a large number of sample points which are uniformly separated in time;

associating sets of said sample points with projection positions which are uniformly separated in space; and

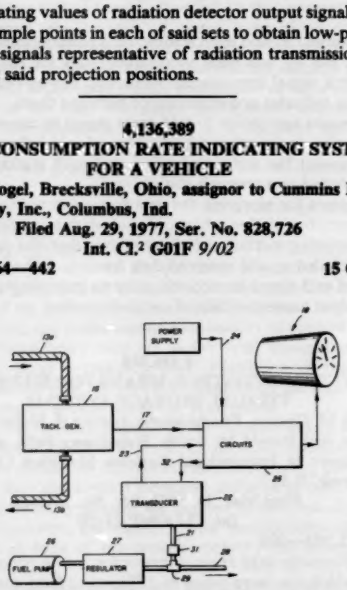


interpolating values of radiation detector output signals from the sample points in each of said sets to obtain low-pass-filtered signals representative of radiation transmission values at said projection positions.

4,136,389
FUEL CONSUMPTION RATE INDICATING SYSTEM FOR A VEHICLE

John D. Vogel, Brecksville, Ohio, assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 29, 1977, Ser. No. 828,726
Int. Cl.[2] G01F *9/02*
U.S. Cl. 364—442 **15 Claims**

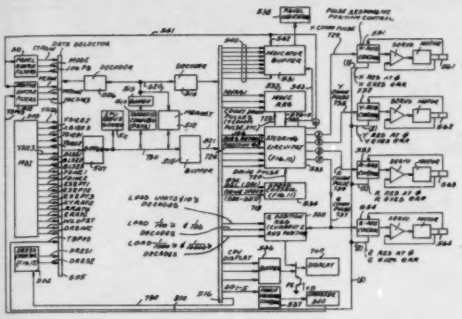


1. A system for measuring and indicating the fuel consumption rate of a vehicle powered by an internal combustion engine, the engine including a fuel supply system wherein the fuel consumption is a function of the pressure of the fuel supplied to the combustion chambers, comprising first means for sensing the fuel pressure and providing a first signal representing the pressure, second means responsive to movement of the vehicle and providing a second signal representing the movement, third means connected to receive said first signal and to convert said first signal to a third signal representing the fuel consumption, a fourth means connected to receive said second and third signals and to provide a fourth signal having one characteristic representing vehicle speed and another characteristic representing the fuel consumption, and fifth means receiving said fourth signal and indicating the fuel consumption rate of the vehicle.

4,136,390
GRINDING CONTROL SYSTEM FOR FORMING NON-CIRCULAR PUNCHING TOOLS

John H. Farrell, Buffalo; Eugene G. Lawrie, North Tonawanda, and Zeev Sagi, Buffalo, all of N.Y., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Nov. 18, 1976, Ser. No. 743,059
Int. Cl.[2] B24B *19/08*; G06F *15/46*
U.S. Cl. 364—474 16 Claims



1. In a multi-axis punch grinding system suitable for the high speed grinding of punches, having a material removing element symmetrical about its axis of rotation, means to rotate said material removing element at a controlled rate, a Z slide, having a Z axis of relative movement perpendicular to and intersecting the axis of rotation of said material removing element with drive means to effect movement of said Z slide, rotary table means having an axis of rotation parallel to that of said material removing element with drive means to effect rotary movement; said rotary table means being mounted on said Z slide; slide means mounted on said rotary table with drive means to effect movement of said slide means; said slide means supporting the workpiece, the improvement comprising:

a control system for said multi-axis punch grinding system comprising input means selectively operable for selecting one of a plurality of closed cross-sectional punch configurations, so as to define a selected final shape for the workpiece, and for pre-specifying a set of dimensional parameters defining a selected final size for the workpiece, axes positioning system means, logic means to control said axes positioning system means, and computer means constructed and arranged to receive data from said input means thereby to digitally pre-store data from the input means including the selected one of the plurality of closed cross-sectional punch configurations and the set of pre-specified dimensional parameters, and having control means for controlling said computer means to produce outputs for said logic means which control said axes positioning system means; said computer means producing said outputs based on the selected one of a plurality of closed cross-sectional punch configurations digitally pre-stored in said computer means and the set of pre-specified dimensional parameters, and the axes positioning system means being controlled automatically to effect movement relative to one axis at a time so that the material removing element repeatedly moves relatively about the perimeter of the workpiece a number of times determined by the data from said input means, each arcuate movement being effected by rotation of the rotary table while the slide and slide means are stationary, such that said workpiece is automatically ground to the selected shape and size.

15. The method of automatically forming punches of a predetermined, closed cross-sectional configuration from tool blanks utilizing a computer controlled, grinding system having a rotary grinding tool, an orthogonal coordinate system mounted on a rotary axis which is parallel to the axis of rotation of the grinding tool wherein the operator selects one of a plurality of prestored punch cross section defining grinding sequences defining respective ones of a set of punch cross section configurations including at least one of rectangular with rounded corners and specifies a set of linear and radial parameters for such desired cross-sectional configuration within the limits of the multi axis grinder comprising the steps of:

calculating the necessary displacements to position the tool blank with respect to the rotary grinding tool at an initial grinding position;

moving the tool blank to the initial grinding position; calculating a first and second linear displacement of the tool blank;

moving the tool blank linearly in a first direction parallel to a first axis of the orthogonal coordinate system an amount corresponding to the first calculated displacement;

sensing a predetermined angle; rotating the orthogonal coordinate system and the tool blank an amount corresponding to the sensed angle;

moving the tool blank linearly in a first direction parallel to a second axis of the orthogonal coordinate system an amount corresponding to the second calculated displacement;

rotating the orthogonal coordinate system and the tool blank an amount corresponding to the sensed angle;

moving the tool blank linearly opposite to the first direction parallel to the first axis of the orthogonal coordinate system a distance corresponding to the first calculated displacement;

rotating the orthogonal coordinate system and the tool blank an amount corresponding to the sensed angle;

moving the tool blank linearly in a direction opposite to the first direction parallel to the second axis of the orthogonal coordinate system an amount corresponding to the second calculated displacement;

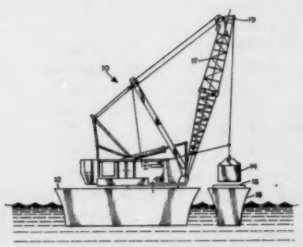
rotating the orghogonal coordinate system and the tool blank an amount corresponding to the sensed angle;

comparing the desired physical dimensions of the tool blank with the actual physical dimensions to determine whether or not the tool blank has achieved the desired physical and repeating the alternate lineal and rotary movements of the tool blank until the comparison step indicates that the desired physical size of the tool blank has been reached.

4,136,391
ADAPTIVE CARGO LANDING SYSTEM

John S. Eterno, Sudbury, Mass., and Richard J. Casler, Jr., Whitehall, Pa., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 8, 1977, Ser. No. 831,505
Int. Cl.[2] B65G *47/00*
U.S. Cl. 364—478 18 Claims



1. System for transferring a load along a path from a load support element to a platform element, said load being a distance L from said load support, and a distance R from said platform element, wherein the distance between said load and said platform element varies substantially periodically with

amplitude peaks being a bandwidth-limited random time function, comprising:

A. means for generating a first signal representative of the distance R,

B. means for generating a second signal representative of the rate of change (R) of distance R,

C. load velocity control means responsive to said first and second signals to control the velocity (L) of said load with respect to said load support element along said path in accordance with:

$$\dot{L}(t) = \int_0^t \ddot{L}(\tau)d_\tau$$

where

$$L = K_R R + K_V R$$

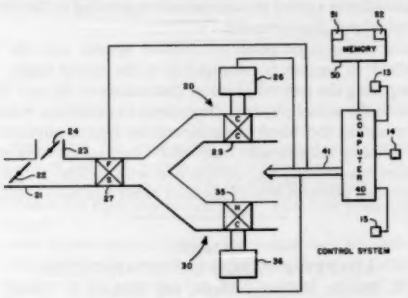
and K_R and K_V are functions of R and R.

4,136,392

LOAD CYCLING WITH SPACE TEMPERATURE FEEDBACK

Bruce D. Westphal, Fox River Grove, and Jim A. Berardi, Highland Park, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 29, 1976, Ser. No. 737,244
Int. Cl.² G05B *15/02*; G06F *15/56*
U.S. Cl. 364—492 **17 Claims**



1. A system for cycling loads in a building comprising:

physical condition responsive means for sensing a physical condition;

memory means having a first group of locations for storing at least one schedule, said schedule containing information relating to a time sequence of operation for at least one load, said memory means having a second group of locations for storing at least one table, said table containing information relating to operational characteristics of each load covered by said table;

processing means connected to said physical condition responsive means and to said memory means for using said information contained in said schedule and table for cycling said loads on and off according to a predetermined cycle rate, each load having an on time and off time within a cycle, said processing means using said physical condition responsive means for resetting said off time; and,

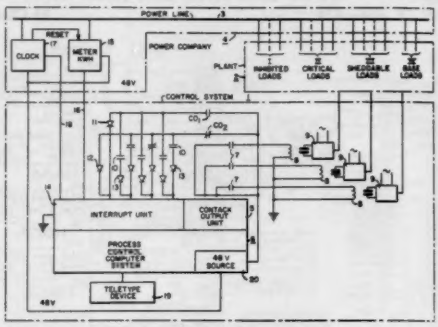
connecting means connected to said processing means and adapted to be connected to said loads for cycling said loads whereby said off time of said loads are reset by said physical condition responsive means.

4,136,393

METHOD OF POWER DEMAND CONTROL WITH TIME DEPENDENT TARGET

Richard Q. Fox, Orlando, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 18, 1977, Ser. No. 816,560
Int. Cl.² H02J *3/00*
U.S. Cl. 364—492 **2 Claims**



1. A method of limiting the power demand of a plant facility having controllable and non-controllable loads by switching said controllable loads during successive demand periods and selectively in accordance with a pre-established priority list, comprising the steps of:

assigning at the beginning of a given demand period a predetermined demand limit to be met at the end of said given demand period;

recording the actual demand at the end of said given demand period;

assigning for a subsequent demand period a demand limit other than said predetermined demand limit, said other demand limit being equal to said recorded actual demand when said actual demand differs from said predetermined demand limit by a predetermined amount;

predicting a demand at the end of any demand period and deriving a demand error by reference to the assigned demand limit with said predicted demand; and

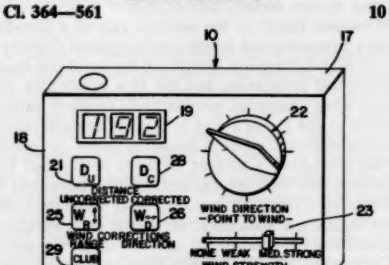
switching said controllable loads during the demand period to minimize said error.

4,136,394

GOLF YARDAGE INDICATOR SYSTEM

Joseph Jones, 121110A Rancho Bernardo Rd., San Diego, Calif. 92128; Steven J. Pang, Honolulu, Hi., and Roland L. Woodard, Jr., 1308 National Ave., New Bern, N.C. 28560, assignors to Joseph Jones, Olivenhain, Calif. and Roland L. Woodard, Jr., New Bern, N.C.

Filed Sep. 23, 1977, Ser. No. 836,073
Int. Cl.² G01S *11/00*
U.S. Cl. 364—561 **10 Claims**



1. A golf distance indicator system for providing a measurement of the distance between a golfer and a green on a golf course, comprising:

a base unit adapted to be mounted near the golf green, said base unit comprising

a radio receiver for receiving RF signals,

means for detecting received RF signals of a predetermined nature, and

a transponder for producing a sonic signal in response to said detecting means; and

a remote unit adapted to be carried by the golfer, said remote unit comprising

a radio transmitter for sending an RF signal to said base unit,

a sonic sensor for receiving said sonic signal from said base unit,

means operatively connected to said radio transmitter and to said sonic sensor for determining the distance between said base unit and said remote unit from the time interval between the sending of said RF signal and the receiving of said sonic signal,

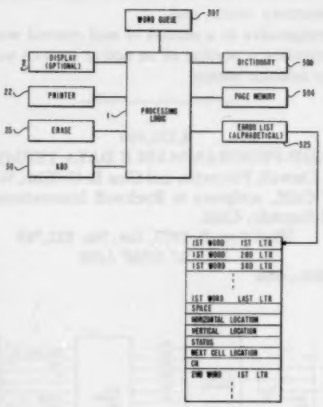
means for inputing wind conditions, and

means for correcting the distance from said determining means in accordance with said input wind conditions.

4,136,395
SYSTEM FOR AUTOMATICALLY PROOFREADING A DOCUMENT

Robert A. Kolpek, Lexington, Ky.; David L. MacDuffee, Ramsey, N.J., and Walter S. Rosenbaum, Bethesda, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,094
Int. Cl.² G06K *9/00*
U.S. Cl. 364—518 **13 Claims**



1. Apparatus for detecting and correcting erroneous data signals in a number of data signals comprising:

a source of data signals;

means for comparing said data signals with a list of valid data signals;

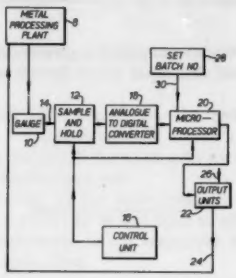
means responsive to said comparing means for indicating erroneous data signals when said erroneous data signals do not compare to said valid data signals; and

means for correcting said erroneous data signals operative such that the correction of one occurrence of said erroneous data signals will automatically correct all similar occurrences of erroneous data signals.

4,136,396
DATA PROCESSING

Michael Hansford, Rugby, England, assignor to Associated Engineering Limited, England

Filed Aug. 18, 1977, Ser. No. 825,610
Claims priority, application United Kingdom, Aug. 19, 1976, 34535/76
Int. Cl.² G05B *21/00*; G06F *15/46*
U.S. Cl. 364—554 **5 Claims**



1. A data processing system for processing measurement data, comprising, in combination,

an input for receiving the measurement data,

sampling means connected to the input and operative when activated to sample the instantaneous value of the measurement data at the input,

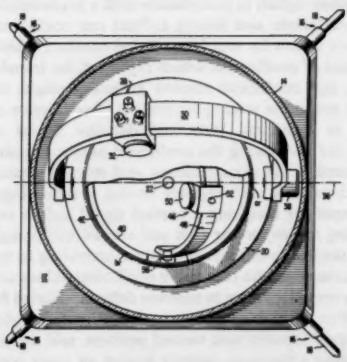
control means connected to the sampling means and operative to produce control signals each of which activates the sampling means, the control means producing the control signals at successive time instants which are randomly or pseudo-randomly distributed in time, and

data processing means connected to receive and process the sampled data values, the data processing means comprising accumulating means for accumulating the sampled data values to derive their mean and standard deviations.

4,136,397
ASTRONOMICAL TIMEPIECE

Darrel J. Pierce, Rte. #1, Box 88, Princeton, Id. 83857

Filed Oct. 3, 1977, Ser. No. 839,007
Int. Cl.² G06F *15/20*; G04B *19/26*; G01C *1/00*
U.S. Cl. 364—569 **25 Claims**



1. A method for determining solar time at any location on a planet similar to earth having a radiating sun and whose period of rotation about its geographic axis is known comprising:

(a) establishing first, second and third vector directions at said location wherein at least one of said vectors is a line of sight to said sun;

(b) determining first and second angles via electronic means responsive to electronic signals representative of said first, second and third vector directions, said first angle lying between said first and second vectors and said second angle lying between said first and third vectors;

(c) determining solar time at said location by use of the equation

$$\text{solar time} = \frac{x}{4} + \frac{x \cos^{-1}\left(\frac{\cos \beta}{\sin \alpha}\right)}{360}$$

where x denotes said period in predetermined time units; α denotes said first angle and β denotes said second angle; and

(d) converting said determined solar time via electronic means to a human readable display.

4,136,398

DIGITAL FILTER HAVING COEFFICIENT NUMBER GENERATOR

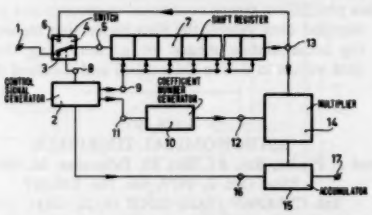
Ludwig D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,535

Claims priority, application Netherlands, May 26, 1975, 7506141

Int. Cl.² G06F *15/34*

U.S. Cl. 364—724 **3 Claims**



1. A digital filter for generating digital output signals from information signals in accordance with a predetermined transfer characteristic and having at least one coefficient number generator means for supplying digital numbers which indicate the values of coefficients which represent the transfer characteristic, said coefficient number generator means comprising storage means for storing increments of successive coefficient values in numerical form and decoder means connected thereto for recovering the coefficient numbers from the numbers stored in the storage means, said storage means comprising a circulating shift register having a signal input, a shift pulse input for receiving a control signal and an output, and switching means having first and second switching positions and connected to said signal input for providing an input signal which comprises the successive coefficient values corresponding to a response curve in uniform delta modulated form when in said first position and for connecting the shift register output to its signal input in said second position, said decoder means comprising a two-way counter having an input connected to the output of said circulating shift register and an output, a second counter having an input for receiving said control signal and an output, and AND-gate circuit means having inputs for receiving the two-way counter and second counter outputs and an output for providing a decoder output which is representative of the count of said two-way counter.

4,136,399

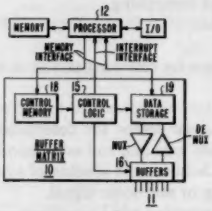
DYNAMIC CHANNEL ALLOCATION BUFFER MATRIX

Robert H. G. Chan, Mt. Laurel, N.J.; Martin R. Mann, Philadelphia, Pa., and Francis M. McDonnell, Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 799,077

Int. Cl.² G06F *1/00*

U.S. Cl. 364—900 **5 Claims**



1. A communications control system including a plurality of buffer means for receiving and transmitting data, data memory means including addressing means, and data port means for storing data, comprising in combination:

buffer selector means for coupling a selected one of said buffer means to the data port means of said data memory means;

control memory means including addressing means and data port means for storing control words in addressed locations;

control word register means having at least one section coupled to the data port means of said control memory means for storing active control words;

means responsive to one section of the control word register means for coupling an address portion of an active control word to the addressing means of said data memory means;

means responsive to a section of said control word register for selectively coupling another address portion of an active control word to the addressing means of said control memory means; and,

means responsive to a section of said control word register for coupling a portion of an active control word to said buffer selector means.

4,136,400

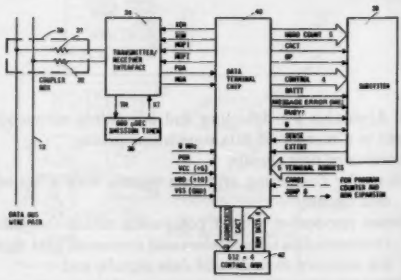
MICRO-PROGRAMMABLE DATA TERMINAL

Robert L. Caswell, Placentia, and Glen R. Griffith, Westminster, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 8, 1977, Ser. No. 822,769

Int. Cl.² G06F *1/00*

U.S. Cl. 364—900 **12 Claims**



1. A single chip programmable data terminal circuit device for use in a time-division multiplex serial data bus system, comprising:

means for control of information transfer between a subsystem and said data bus, in a remote terminal mode; and

means for control of information transfer between a subsystem and said data bus, in a bus controller mode.

4,136,401

STORAGE MODULE

Paul-Werner von Basse, Wolfratshausen-Farchet, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 26, 1976, Ser. No. 745,239

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553344

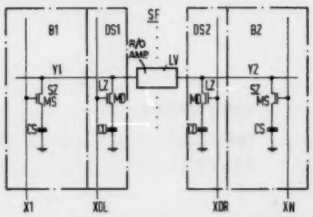
Int. Cl.[2] **G11C** *11/40*

U.S. Cl. 365—208 **2 Claims**

1. In a storage module of the type in which a plurality of single-transistor storage cells are arranged between word lines and bit lines to form a cell field, in which the cells comprise a single-transistor and a capacitance connected thereto, in which the cell field is divided into two zones in that the bit lines are divided into two halves, in which a read out amplifier is connected, in each case, between the two halves of each bit line, and at least one blank cell is arranged in each zone of the cell field in respect of each half of the bit line, the improvement therein:

said blank cells constructed identically to the storage cells;

means for selecting the blank cells during the operating interval of the storage cells of the cell field so that the



storage capacitances of the blank cells are charged to the potential of the bit lines; and

means for switching off the blank cells of a zone upon the selection of a word line of that zone to effect oppositely directed interferences to the respective bit line half to compensate each other.

DESIGN PATENTS

GRANTED JAN. 23, 1979

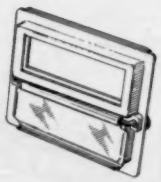
ERRATA

For CLASS	See PATENT NO.
D99–027	250,900
D18–001	250,914

DESIGNS

JANUARY 23, 1979

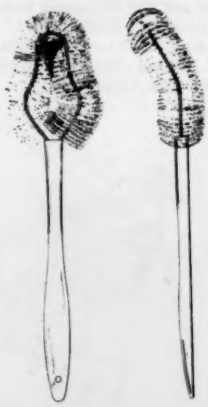
250,856
WINDOW FOR WELDER'S HELMET
Carl J. Siebert, 3344 W. Harvard, Santa Ana, Calif. 92704
Filed May 6, 1977, Ser. No. 794,389
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



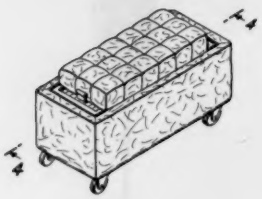
250,857
GOLF SHOE
Richard M. Procter, 1721 Kingsbury La., Oklahoma City, Okla. 73116, and James E. Walker, 3000 Kerry La., Oklahoma City, Okla. 73120
Filed Apr. 2, 1976, Ser. No. 673,125
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—311

250,858
BRUSH
Sakuzo Yamaguchi, Tokyo, Japan, assignor to Yugen Kaisha Yamaguchi Burashi Seisakusho, Tokyo, Japan
Filed Aug. 9, 1977, Ser. No. 823,214
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—08

250,859
BRUSH
Aldo A. Artiano, Springfield, Mass., assignor to Stanley Home Products, Inc., Westfield, Mass.
Filed Mar. 31, 1977, Ser. No. 783,397
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—09

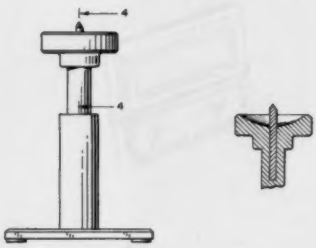


250,860
COMBINED COCKTAIL TABLE, OTTOMAN, REMOVABLE TRAY AND STORAGE CHEST UNIT
Bernard Castro, Long Island, N.Y., assignor to Castro Convertible Corporation, New Hyde Park, N.Y.
Filed Sep. 30, 1976, Ser. No. 728,021
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—4

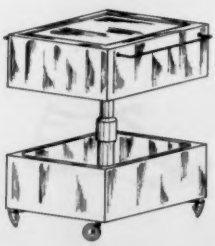


250,861
CHILD'S SWING
Robert J. Boudreau, and Joel C. Cunard, both of Bedford, Pa., assignors to Hedstrom Co., Bedford, Pa.
Filed Jan. 17, 1977, Ser. No. 759,653
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—10

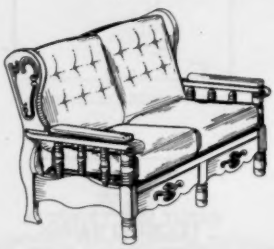
250,862
COMBINED STICK INSERTER AND DISPLAY STAND FOR A FOOD PRODUCT
Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.
Filed Jul. 12, 1976, Ser. No. 704,432
The portion of the term of this patent subsequent to Oct. 17, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*99*; D20—*02*
U.S. Cl. D6—25



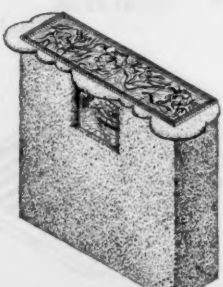
250,863
MOBILE ADJUSTABLE TABLE
Enzo Berti, Pianiga (Venice), Italy, assignor to Magis S.R.L., Motta di Livenzia, Italy
Filed Mar. 15, 1977, Ser. No. 777,572
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—25



250,864
SEAT
Leonard Eisen, Montvale, N.J., assignors to Trend Line Furniture Corporation, Hickory, N.C.
Filed May 11, 1977, Ser. No. 795,984
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62

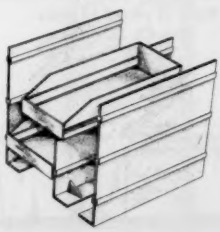


250,865
BAR OR SIMILAR ARTICLE
Lloyd J. Finch, 427 Fillmore St., San Francisco, Calif. 94117
Continuation-in-part of Ser. No. 748,800, Dec. 8, 1976, abandoned. This application May 15, 1978, Ser. No. 905,929
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—144



250,866
STAND
John M. Mulligan, 3 Nelson Ridge Rd., Princeton, N.J. 08540
Filed Jan. 4, 1977, Ser. No. 757,307
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—151

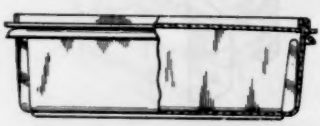
250,867
ADJUSTABLE DRAWER UNIT OR SIMILAR ARTICLE
Clayton A. Elliott, 1931 Arbor La., Union, N.J. 07083
Filed Nov. 11, 1976, Ser. No. 740,773
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



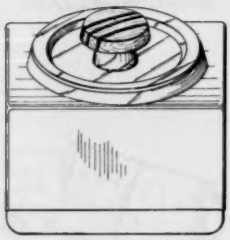
250,868
MODULAR DISPLAY CABINET
Bridget C. Ornatek, Glenview, Ill., assignor to Contempo Design Inc., Northfield, Ill.
Filed Dec. 16, 1977, Ser. No. 861,326
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—167

250,869
PITCHER
Frederick W. Boelter, 15020 Pomona Rd., Brookfield, Wis. 53005
Filed Aug. 16, 1977, Ser. No. 825,050
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64

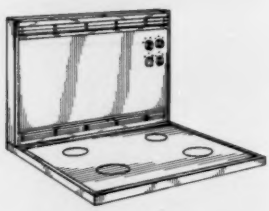
250,870
COVERED STORAGE CONTAINER
Alwin J. Stahel, Brighton, Mich., assignor to Ball Corporation, Muncie, Ind.
Filed Feb. 6, 1976, Ser. No. 655,945
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—76



250,871
CANISTER BIN
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 15, 1976, Ser. No. 741,773
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79



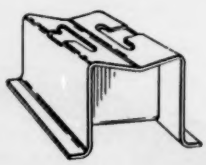
250,872
COOKING RANGE
Tiarko Meunier, Mennecy (Essonne), France, assignor to Thomson-Brandt, Paris, France
Filed Jun. 30, 1976, Ser. No. 701,159
Claims priority, application France, Feb. 11, 1976, 76 74549
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—124



250,873
BIN COVER
Robert J. Fagliano, Walnut Creek; Ross C. Burkhardt, Berkeley, and Bruce W. Scharmer, San Ramon, all of Calif., assignors to E-Z Lift Corporation, Walnut Creek, Calif.
Filed Oct. 4, 1976, Ser. No. 729,853
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—194

250,874
TOOL RETAINER FOR A HAND HELD POWER TOOL
Marcel P. D'Haem, New Hartford, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Sep. 28, 1976, Ser. No. 727,531
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70

250,875
SUPPORT FOR TUBES
Lars-Olov H. Lindblom, Husum, Sweden, assignor to LOLAB, Sweden
Filed Feb. 26, 1975, Ser. No. 553,161
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356



250,876
SUPPORT FOR TUBES
Lars-Olov H. Lindblom, Husum, Sweden, assignor to LOLAB, Sweden
Filed Feb. 26, 1976, Ser. No. 553,162
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

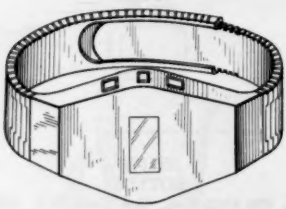
250,877
HANGER OR THE LIKE
Frederick J. Miavitz, 7040 Shaner Rd., Walton Hills, Ohio 44146
Filed May 3, 1977, Ser. No. 793,438
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—373

250,878
BOTTLE
Inez M. McGowen, 930 Pine St., San Francisco, Calif. 94108
Filed Feb. 17, 1977, Ser. No. 769,744
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48

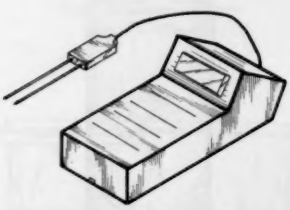
250,879
BOTTLE
Cedric Marks, 880 Fifth Ave., New York, N.Y. 10021
Filed Dec. 27, 1976, Ser. No. 754,610
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—72

250,880
COMPARTMENTED FOOD PACKAGE
David S. Stone, and Maurice A. Sokoloff, both of 31-11 92nd St., Jackson Heights, N.Y. 11369
Filed Apr. 25, 1977, Ser. No. 790,370
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187

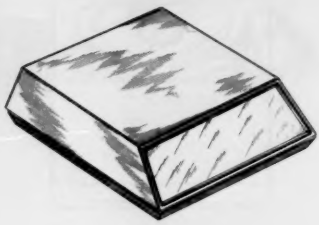
250,881
COMBINED DIGITAL WATCH AND BAND
James P. Liautaud, River & Bluff Rds., Trout Valley, Cary, Ill. 60023
Filed Mar. 9, 1977, Ser. No. 776,004
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32



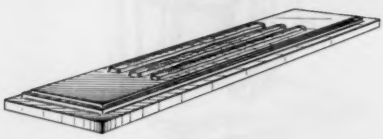
250,882
SOIL HUMIDITY METER
Villi Johansen, Sjaelland, Denmark, assignor to Substral International, Pernille S.A., Fribourg, Switzerland
Filed Nov. 15, 1976, Ser. No. 742,166
Term of patent 7 years
Int. Cl. D10—*04*
U.S. Cl. D10—56



250,883
SCALE BASE CABINET
George E. Hudson, Santa Rosa, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.
Filed Nov. 22, 1976, Ser. No. 744,155
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—94

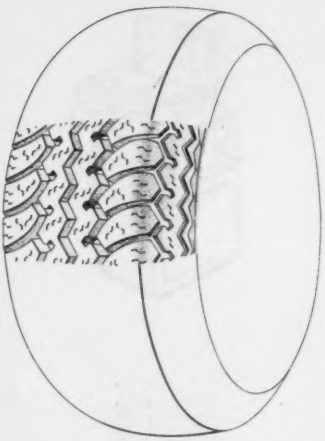


250,884
PLAQUE
James W. Price, Dallas, Tex., assignor to Elevations/Design, Inc., Dallas, Tex.
Filed Aug. 19, 1976, Ser. No. 716,003
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—140

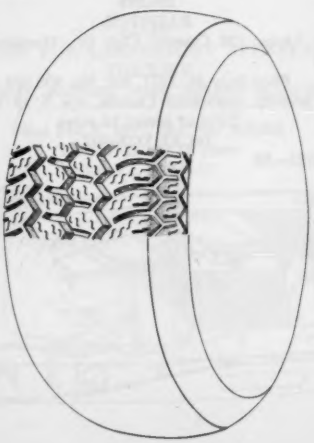


250,885
RELIGIOUS FIGURE
Lawrence D. Newman, 88 College Ave., Factoryville, Pa. 18440
Division of Ser. No. 690,680, May 27, 1976, Pat. No. Des. 248,459
This application Dec. 20, 1977, Ser. No. 863,333
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

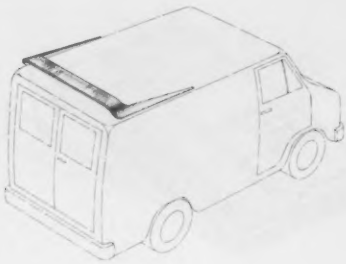
250,886
PNEUMATIC TIRE TREAD AND BUTTRESS
Hans J. Voegler, Herzogenrath-Merkstein, Fed. Rep. of Germany, assignor to Uniroyal Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 13, 1977, Ser. No. 806,140
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 20 MR 3158
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



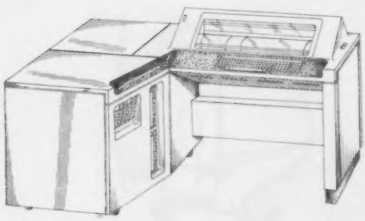
250,887
PNEUMATIC TIRE TREAD AND BUTTRESS
Dionysius J. Poque, Aachen, Fed. Rep. of Germany, assignor to Uniroyal Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 13, 1977, Ser. No. 806,255
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 20 MR 3159
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



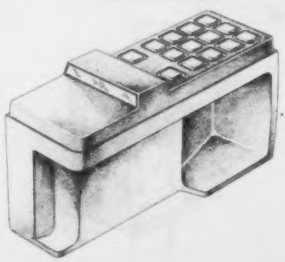
250,888
AIR DEFLECTOR FOR VANS AND SIMILAR VEHICLES
John T. Bruno, 21 Esplanada, Irvine, Calif. 92715
Filed Jul. 11, 1977, Ser. No. 814,710
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



250,889
COMPUTER SYSTEM
Richard G. Clayton, Detroit, and Jerry J. Sims, Southfield, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Apr. 27, 1977, Ser. No. 791,293
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—44



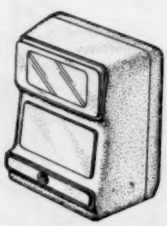
250,890
TELEPHONE STATION SET BASE
Rembert R. Stokes, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 21, 1977, Ser. No. 789,737
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



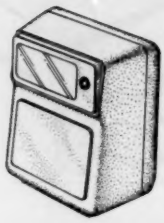
250,891
AUTOMATIC TELEPHONE DIALER
Marc Renard, Pierrefitte, France, assignor to Societe Peritel S.A.R.L., Boulogne, France
Filed Jan. 26, 1977, Ser. No. 762,639
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

250,892
GRASS AND LEAF COLLECTOR FOR A LAWN MOWER
Harold P. Jackson, McDonough, Ga., assignor to McDonough Power Equipment, Inc., McDonough, Ga.
Continuation-in-part of Ser. No. 799,755, May 23, 1977. This application Jun. 3, 1977, Ser. No. 803,419
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—27

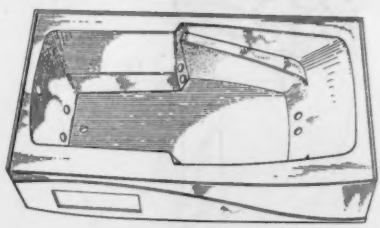
250,893
STROBOFLASH
Shuji Ozawa, Tokyo, Japan, assignor to Sunpak Corporation, Tokyo, Japan
Filed Jun. 23, 1977, Ser. No. 809,626
Claims priority, application Japan, Mar. 15, 1977, 52-9254
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



250,894
STROBOFLASH
Shuji Ozawa, Tokyo, Japan, assignor to Sunpak Corporation, Tokyo, Japan
Filed Jun. 23, 1977, Ser. No. 809,628
Claims priority, application Japan, Mar. 15, 1977, 52-9253
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



250,895
BATHTUB
Arthur S. Laver, 128 Country Club Dr., Hamilton, Ontario, Canada
Filed May 24, 1977, Ser. No. 800,096
Claims priority, application Canada, Apr. 5, 1977, 0504773
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



250,896

COIN OPERATED AUTOMATIC BLOOD PRESSURE TESTING APPARATUS OR THE LIKE

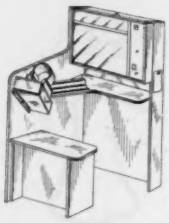
Thomas G. Huber, and Johnston R. Staples, Jr., both of St. Petersburg, Fla., assignors to Vita-Stat Medical Services, Inc., St. Petersburg, Fla.

Filed Mar. 21, 1977, Ser. No. 779,931

Term of patent 14 years

Int. Cl. D24—*01;* D20—*01*

U.S. Cl. D24—21



250,897

WIRE GUIDE FOR LABORATORY APPARATUS AND THE LIKE

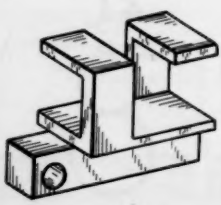
Robert S. Potts, Sherborn, Mass., assignor to Corning Glass Works

Filed Feb. 7, 1977, Ser. No. 765,948

Term of patent 14 years

Int. Cl. D24—*02*

U.S. Cl. D24—29



250,898

BUILDING BLOCK

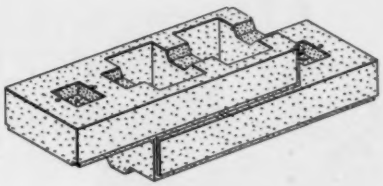
James A. Schuring, 352 Saratoga Ave., NW., Canton, Ohio 44708

Filed May 9, 1977, Ser. No. 795,406

Term of patent 14 years

Int. Cl. D25—*01*

U.S. Cl. D25—86



250,899

CIGARETTE LIGHTER

Vytautas K. Beleckis, Oakhurst, N.J., assignor to Ronson Corporation, Bridgewater, N.J.

Filed Apr. 11, 1977, Ser. No. 786,215

Term of patent 14 years

Int. Cl. D27—*05*

U.S. Cl. D27—42

250,900

CRUCIFIX

Lawrence D. Newman, 88 College Ave., Factoryville, Pa. 18440

Division of Ser. No. 690,680, May 27, 1976, Pat. No. Des. 248,459.

This application Dec. 20, 1977, Ser. No. 862,360

Term of patent 14 years

Int. Cl. D31—*00*

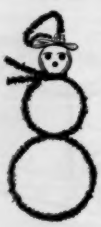
U.S. Cl. D99—27

250,901
TOY FIGURE
Timothy A. Effler, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Apr. 28, 1977, Ser. No. 791,664
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

250,902
MARIONETTE
Jerome F. Fletcher, P.O. Box 745, Lief, Tex. 77411, and Wayne H. Shampang, 1521 Sherwood Forest Dr., Apt. 289, Houston, Tex. 77077
Filed May 11, 1977, Ser. No. 795,705
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

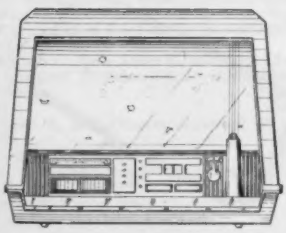
250,903
BELL BEADED FIGURE
Tommye C. Bowden, 2806 Tucker Rd., Nashville, Tenn. 37218
Filed Jun. 27, 1977, Ser. No. 810,280
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

250,904
BEADED FIGURE
Tommye C. Bowden, 2806 Tucker Rd., Nashville, Tenn. 37218
Filed Jun. 27, 1977, Ser. No. 810,281
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

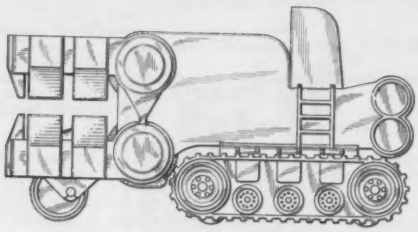


250,905
GAME RACKET
Ralph V. Sawyer, Rumford, R.I., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Dec. 15, 1976, Ser. No. 750,937
The portion of the term of this patent subsequent to Aug. 30, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

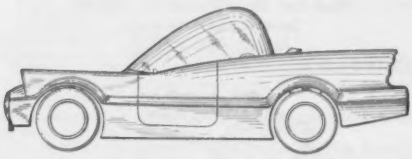
250,906
ELECTRONIC BATTLE GAME CABINET
Lawrence L. Reiner, 1 Hickory Lane, Woodbury, N.Y., and Michael Hennig, Fort Lee, N.J., assignors to Lawrence L. Reiner
Filed Jan. 31, 1977, Ser. No. 763,816
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



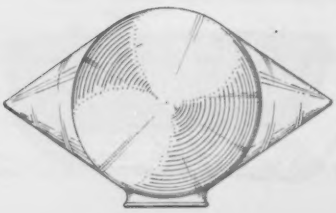
250,907
TOY VEHICLE
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039
Filed Jun. 20, 1977, Ser. No. 808,243
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



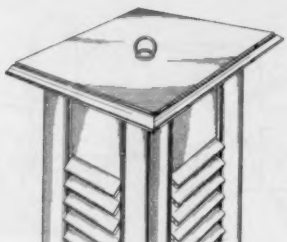
250,908
TOY AUTOMOBILE
Mel Appel, 9 Nottingham Rd., Livingston, N.J. 07039
Filed Jun. 20, 1977, Ser. No. 808,244
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



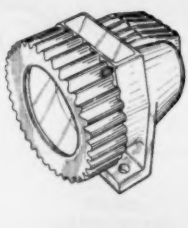
250,909
GLOBE FOR A LAMP
Norman R. Carter, 4000 San Rafael Ave., Los Angeles, Calif. 90065
Filed Aug. 23, 1976, Ser. No. 716,931
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 C



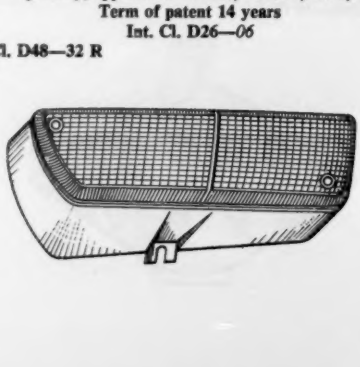
250,910
LIGHTING FIXTURE OR THE LIKE
George R. Clark; Gary A. Meeks, and Dannie D. Sudduth, all of Houston, Tex., assignors to Erth-Lite, Inc.
Filed Mar. 25, 1977, Ser. No. 781,441
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



250,911
MINING MACHINE HEADLIGHT
H. P. McJunkin, Jr., Charleston, W. Va., assignor to McJunkin Corporation
Filed Apr. 26, 1977, Ser. No. 790,907
Term of patent 14 years
Int. Cl. D26—*05, 06*
U.S. Cl. D48—24 B



250,912
CAR FRONT SIGNAL LIGHT
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Jul. 21, 1975, Ser. No. 597,689
Claims priority, application France, Feb. 20, 1975, 73 636
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



250,913
COMBINED LAMP AND ILLUMINATED ADDRESS SIGN
Walter Koziol, Russell, Ill., assignor to Beatrice Foods Co., Chicago, Ill.
Filed Sep. 29, 1976, Ser. No. 728,020
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—36

250,914
PORTABLE TYPEWRITING MACHINE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed May 25, 1976, Ser. No. 689,916
Claims priority, application Italy, Jul. 10, 1975, 53215 B/75
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

250,915
COMBINED CHECKBOOK HOLDER AND LOCK WITH KEYS
Samuel W. H. Boyce, 100 Wilshire Blvd. Ste. 304, Santa Monica, Calif. 90401
Filed Feb. 9, 1977, Ser. No. 766,934
Term of patent 3½ years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
Finn, William M.; Peck, Michael C.; and Winstead, Maynard R., 4,136,075, Cl. 260-29.6TA.

A. O. Smith Harvestore Products, Inc.: *See—*
Warren, Bruce J., 4,135,443, Cl. 99-646.00S.

A/S Alto: *See—*
Arisland, Kiell O., 4,135,513, Cl. 128-252.000.

A/S Hotaco: *See—*
Harder, Sven, 4,136,223, Cl. 428-139.000.

A/S Kobenhavns Pektinfabrik: *See—*
Jakobsen, Ole M., 4,136,031, Cl. 210-267.000.

A-T-O Inc.: *See—*
Latina, Roland N.; and Mitchell, Hal D., 4,135,252, Cl. 2-2.000.

Abbeloos, Charles. Flash synchronization interlock. 4,135,796, Cl. 354-126.000.

Abbott Laboratories: *See—*
Dren, Anthony T.; and Bopp, Barbara A., 4,136,183, Cl. 424-248.560.

Abcouwer, Jan A.: *See—*
D'Entremont, John R.; and Abcouwer, Jan A., 4,136,323, Cl. 337-107.000.

Abe, Kiyomi; and Kameda, Hidetoshi, to Pentel Kabushiki Kaisha. Keyboard apparatus. 4,136,336, Cl. 340-365.00S.

Abe, Tadashi; Horiuchi, Tatumi; Nakamura, Ken; Ohyama, Yoshio; and Kurihara, Shigeatsu, to Konishiroku Photo Industry Co., Ltd. Power transmission control mechanism for use in the copying apparatus. 4,135,806, Cl. 355-8.000.

Abiko, Yasushi: *See—*
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-Ya; and Ono, Shin-etu, 4,136,188, Cl. 424-273.00R.

ACF Industries, Incorporated: *See—*
Fowler, James M.; and Moran, George A., 4,135,545, Cl. 137-246.220.
Morrison, Bertram L., 4,135,546, Cl. 137-315.000.

Acme-Cleveland Corporation: *See—*
Drobnik, Leszek R.; and Rebish, Edward J., 4,135,569, Cl. 164-158.000.

Acosta, Adam. Plumb bob retriever. 4,135,753, Cl. 294-115.000.

Acurex Corporation: *See—*
Kennedy, William S., 4,135,493, Cl. 126-271.000.

Acushnet Company: *See—*
Sullivan, Paul F.; Lynch, Francis deS.; Gobush, William; and Hottel, Hoyt C., Jr., 4,136,387, Cl. 364-410.000.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Reaction mechanism of a hydraulic control valve. 4,135,435, Cl. 91-6.000.

Addressograph-Multigraph Corporation: *See—*
Szabo, Francis S.; and Pick, George G., 4,135,794, Cl. 354-5.000.

Adler, Franklin P., to Illinois Railway Equipment Company. Adjustable support for bottom brake connecting rods for railway cars. 4,135,608, Cl. 188-210.000.

Advanced Micro Devices, Inc.: *See—*
Price, William L., 4,135,295, Cl. 29-623.000.

Aerotherm, Inc.: *See—*
Houser, John E.; and Kramer, Ralph J., 4,135,907, Cl. 71-9.000.

AG Licento: *See—*
Persson, Leif; Hansen, Bonde; and Eklund, Erik, 4,136,005, Cl. 204-266.000.

Agency of Industrial Science & Technology: *See—*
Kikkawa, Masayoshi, 4,135,942, Cl. 106-155.000.

AGFA-Gevaert AG: *See—*
Blank, Rudolf; and Kluczynski, Achim, 4,135,680, Cl. 242-74.000.
Scharre, Normann; and Bartel, Siegfried, 4,135,802, Cl. 354-275.000.
Thate, Kurt; and Bruckl, Konrad, 4,135,698, Cl. 251-61.100.
Walter, Karl, 4,135,810, Cl. 355-29.000.

Aikawa, Akira; Oguchi, Masao; Takeda, Toshihide; Kisaichi, Akio; and Saito, Toshio, to Kanebo, Ltd. Process for improving antistatic and hygroscopic properties of fibers or fibrous structures made thereof. 4,135,877, Cl. 8-115.500.

Ailawadhi, Manohar L.; Ryan, James H.; and Wahi, Chander M., to E. F. Johnson Company. Solderless coaxial cable connector. 4,135,776, Cl. 339-177.00R.

Airco, Inc.: *See—*
Kirk, Bradley S.; and Chappel, Raymond M., 4,136,023, Cl. 210-7.000.

Aisan Industry Col., Ltd.: *See—*
Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,136,139, Cl. 261-44.00C.

Aisin Seiki Kabushiki Kaisha: *See—*
Adachi, Yoshiharu, 4,135,435, Cl. 91-6.000.
Fujii, Takashi; Nakamura, Hiroyuki; and Souma, Teruo, 4,135,635, Cl. 220-85.00B.

Akasaka, Hideki: *See—*
Takahashi, Youske; and Akasaka, Hideki, 4,135,790, Cl. 350-357.000.

Akgulian, Sahag C., to Jacobsen Manufacturing Company. Rotary lawn mower grass mulcher. 4,135,351, Cl. 56-255.000.

Akizuki, Hiroyuki: *See—*
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,136,063, Cl. 252-466.00J.

Akkerman, Neil H.; and Foster, Stephen R., to Baker International Corporation. Quick disengaging valve actuator. 4,135,547, Cl. 137-315.000.

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Hultgren, K. Sten R.; and Sundmar, J. P. Goran, 4,135,433, Cl. 89-47.000.

Aktiebolaget Karlstads Mekaniska Werkstad: *See—*
Jansson, Eric O.; Naucler, Bengt O.; and Asberg, Thomas, 4,135,853, Cl. 415-204.000.

Aktiebolaget SAMEFA: *See—*
Horvallius, Torgny W., 4,135,823, Cl. 356-148.000.

Akzona Incorporated: *See—*
Franks, Neal E., 4,136,255, Cl. 536-60.000.

Albertsen, Peter S., to Corning Glass Works. Armored piping system. 4,135,741, Cl. 285-55.000.

Alcock, Robert N.; Lucas, David A.; and Vincent, Richard P., to U.S. Philips Corporation. Resolving angular ambiguity. 4,136,342, Cl. 343-113.00R.

Aleksandrovic, Sakharov B.: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.

Aleksandrovic, Zabotin A.: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.

Alekseevich, Borodin V.: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.

Alessio, Lorenzo E., to Black and Decker Manufacturing Company, The. Gear transmission. 4,135,411, Cl. 74-417.000.

Allgeyer, David F.; Musgrave, Donald A.; and Reifeiss, Lester F., to UMC Industries, Inc. Dual temperature merchandiser. 4,135,369, Cl. 62-251.000.

Allied Chemical Corporation: *See—*
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,135,280, Cl. 28-257.000.
Stephenson, Robert L.; Gavagan, James; and Loomba, Yogendra S., 4,135,683, Cl. 242-107.40A.
Tanner, Lee E.; and Ray, Ranjan, 4,135,924, Cl. 75-159.000.

Allis-Chalmers Corporation: *See—*
Barth, John W., 4,135,597, Cl. 180-139.000.

Alloy Metals, Inc.: *See—*
Stern, Marvin J., 4,135,656, Cl. 228-263.000.

Almquist, Hans; Nilsson, Lars-Olof; and Skoog, Hans, to ASEA Aktiebolag. Torque limiting drive with slip monitor. 4,136,303, Cl. 318-52.000.

Alpha Nova Development Corp.: *See—*
Winkler, Robert J.; Harris, Colin G.; and Sprague, Terry A., 4,135,668, Cl. 239-276.000.

Alquier, Michel E. L.: *See—*
Capdevila, Claudio; Juan, Francois A.; Venditti, Gaetan; and Alquier, Michel E. L., 4,135,695, Cl. 249-118.000.

Aluminum Company of America: *See—*
Cebulak, Walter S., 4,135,922, Cl. 75-143.000.
Meyer, Raymond J.; Johnson, Wayne F.; and Wodehouse, Richard A., 4,136,026, Cl. 210-45.000.

Alza Corporation: *See—*
Capozza, Richard C., 4,136,252, Cl. 528-403.000.
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,135,514, Cl. 128-260.000.

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Hays, Herbert G., 4,135,487, Cl. 126-110.00R.

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Henley, Thomas D., 4,136,217, Cl. 427-327.000.

American Air Filter Company, Inc.: *See—*
Westlin, Karl; and Rose, Charles E., 4,135,900, Cl. 55-499.000.

American Beauty Macaroni Company: *See*—
Pellaton, Roy C., 4,135,616, Cl. 198-423.000.
American Can Company: *See*—
Shuppert, Laurence V.; Hanson, William D.; and Willer, Robert A., 4,135,960, Cl. 156-240.000.
American Cyanamid Company: *See*—
Diehl, Robert E.; Levy, Stephen D.; and Gastrock, William H., 4,136,117, Cl. 260-577.000.
Glick, Arthur, 4,135,622, Cl. 206-63.300.
Kazan, John, 4,136,101, Cl. 260-429.900.
Shepherd, Robert G., 4,136,256, Cl. 544-88.000.
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Lin, Song-Ling; and Pramoda, Maturu K., 4,136,177, Cl. 424-211.000.
Lin, Song-Ling; and Pramoda, Maturu K., 4,136,178, Cl. 424-211.000.
Pramoda, Matura K.; and Lin, Song-Ling, 4,136,173, Cl. 424-177.000.
American Optical Corporation: *See*—
Deeg, Emil W.; and Travnicek, Edward A., 4,135,792, Cl. 351-41.000.
Ammann, Rudolf, to Dow Chemical Company, The. Flexible polyurethane foams based upon the use of a soluble amine salt as crosslinking agent. 4,136,241, Cl. 521-163.000.
Amos of Exeter Limited: *See*—
Amos, Raymond E., 4,136,373, Cl. 361-151.000.
Amos, Raymond E., to Amos of Exeter Limited. Bulk tape eraser. 4,136,373, Cl. 361-151.000.
AMP Incorporated: *See*—
Balon, Gary D., 4,135,378, Cl. 72-14.000.
Rose, William H., 4,136,268, Cl. 200-17.00R.
Weidler, Charles H., 4,136,269, Cl. 200-67.00D.
Analog Devices, Inc.: *See*—
Tsang, Wei K., 4,136,349, Cl. 357-13.000.
Anders, Raymond H.: *See*—
Wernet, William F.; and Anders, Raymond H., 4,136,270, Cl. 200-340.000.
Andersen 2000, Inc.: *See*—
Himes, Richard C.; and Craig, Bruce G., 4,135,894, Cl. 55-91.000.
Anderson, C. Lawrence; and Dunlap, Howard L., to Hughes Aircraft Company. Process for annealing semiconductor materials. 4,135,952, Cl. 148-1.500.
Anderson, Gordon H., to Rockwell International Corporation. Adjustable tube coupling. 4,135,742, Cl. 285-87.000.
Anderson, John K. Dual flush toilet mechanism. 4,135,263, Cl. 4-324.000.
Andersson, Sven E., to Trelleborg Rubber Company, Inc. Pinch valve control circuit. 4,135,550, Cl. 137-565.000.
Andreas Stihl, Firma: *See*—
Hoeppner, Klaus, 4,135,301, Cl. 30-381.000.
Andrew Corporation: *See*—
Dyott, Richard B., 4,135,780, Cl. 350-96.150.
Anger, Klaus; Lischke, Burkhard; Oelmann, Andreas; and Reschke, Helmut, to Siemens Aktiengesellschaft. Method for irradiating a specimen by corpuscular-beam radiation. 4,136,285, Cl. 250-492.00A.
Ankenman, Thomas W.: *See*—
Swenson, Edward L.; and Ankenman, Thomas W., 4,135,352, Cl. 56-341.000.
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,135,444, Cl. 100-50.000.
Annunziata, Eugene J.; James, Robert S.; and Tan, Kwang G., to International Business Machines Corporation. Backing store access coordination in a multi-processor system. 4,136,386, Cl. 364-200.000.
Antenore, Ronald L., to James D. Pauls & Associates, Ltd. Perimeter alarm apparatus. 4,136,338, Cl. 340-551.000.
Anthony, Andrew J.; and Groves, Malcolm D., to Combustion Engineering, Inc. Nuclear reactor spacer assembly. 4,135,972, Cl. 176-78.000.
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Kaiya, Atsushi; Arai, Eizo; Kawaguchi, Hideo; and Miyazaki, Kazuo, 4,136,088, Cl. 260-669.00P.
Arbrook, Inc.: *See*—
Stockum, Glenn F., 4,135,867, Cl. 425-275.000.
Archakovich, Onikov E.: *See*—
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.
Archer, John D., to International Standard Electric Corporation. Optical fiber termination. 4,135,781, Cl. 350-96.200.
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Ladish, Charles E.; and Hill, Earl S., Jr., 4,136,072, Cl. 260-27.00R.
ARENCO-BMD Maschinenfabrik GmbH: *See*—
Muller, Gunter, 4,135,570, Cl. 164-182.000.
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Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,136,081, Cl. 260-45.80N.
Arisland, Kiell O., to A/S Alto. Drinking nozzle for bottles and similar containers. 4,135,513, Cl. 128-252.000.
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Dieck, Ronald L.; Goldfarb, Louis; and Hann, Nancy D., 4,136,084, Cl. 528-481.000.
Greiner, William A., Jr.; and Evans, Richard J., 4,135,675, Cl. 242-67.10R.
Johnson, Norman A.; and Kent, Raymond C., 4,135,341, Cl. 52-316.000.
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Madsen, Peter E.; Lee, James A.; and Armstrong, Derek, 4,135,293, Cl. 29-599.000.
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Kleefeldt, Frank; and Krause, Lothar, 4,135,377, Cl. 70-264.000.
Arnason, Tomas; and Blaska, Rudolf, to Swiss Aluminum Ltd. Cell for fused-salt electrolysis with gas collecting means. 4,136,003, Cl. 204-247.000.
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Galberth, Robert L.; Arnold, Roy L.; and Bollinger, John C., 4,136,309, Cl. 320-2.000.
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Clark, Melvin D., 4,135,602, Cl. 181-230.000.
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Hardwicke, Robert L., 4,135,765, Cl. 301-36.00R.
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Yano, Nobumitsu; Fukinbara, Itaru; and Takano, Mitsuo, 4,136,065, Cl. 252-522.000.
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Asai, Akira: *See*—
Hishida, Yukio; Asai, Yuichi; Kondo, Toshikatsu; Asai, Akira; Sakaida, Atsuo; and Miyazawa, Chiaki, 4,135,830, Cl. 400-124.000.
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Hishida, Yukio; Asai, Yuichi; Kondo, Toshikatsu; Asai, Akira; Sakaida, Atsuo; and Miyazawa, Chiaki, 4,135,830, Cl. 400-124.000.
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Takahashi, Kenji; Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,136,237, Cl. 521-27.000.
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Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; Sasaki, Kanemichi; and Hasegawa, Kouji, 4,136,191, Cl. 424-279.000.
Asberg, Thomas: *See*—
Jansson, Eric O.; Naucler, Bengt O.; and Asberg, Thomas, 4,135,853, Cl. 415-204.000.
ASEA Aktiebolag: *See*—
Almquist, Hans; Nilsson, Lars-Olof; and Skoog, Hans, 4,136,303, Cl. 318-52.000.
Dahle, Orvar, 4,135,391, Cl. 73-136.00A.
Ashe, Thomas L., to Garrett Corporation, The. Heat storage method and apparatus. 4,136,276, Cl. 219-378.000.
Ashton, George, to L. M. Dearing Associates, Inc. Solar chronometer. 4,135,357, Cl. 58-1.00R.
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Penterman, Lou F.; and Geverink, Harry, 4,135,614, Cl. 198-306.000.
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Hansford, Michael, 4,136,396, Cl. 364-554.000.
Assouly, Pierre, to Schering Corporation. Syringe barrel. 4,135,510, Cl. 128-218.00R.
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Lorenz, Leo J.; and Asztalos, Auguste, 4,135,731, Cl. 280-461.00A.
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Blieden, Harry R.; and MacDonald, Roderick W., 4,135,537, Cl. 136-89.0PC.
DeVries, Donald L.; and DeJovine, James M., 4,136,040, Cl. 252-30.000.
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van Nederkassel, Ludovicus J., 4,135,860, Cl. 417-12.000.
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Stephenson, Reginald M., 4,135,272, Cl. 15-147.00R.
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Weidanz, Herbert; and Auf Dem Graben, Horst, 4,135,800, Cl. 354-174.000.
Auracher, Franz; and Bell, Guido, to Siemens Aktiengesellschaft.

Method for the production of light conductor structures with interlaying electrodes. 4,136,212, Cl. 427-38.000.

Autelli, Giulio. Multi-nozzle multiple lance for washing rotating heat exchangers and a distributor for said lance. 4,135,534, Cl. 134-170.000.

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La Chiusa, Arturo A., 4,135,609, Cl. 192-3.00S.

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Hench, Hans H. W.; and Muller, Leo K. M., 4,135,767, Cl. 302-31.000.

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Skarvada, Thomas, 4,135,403, Cl. 73-384.000.

B & B Italia S.p.A.: *See*—
Busnelli, Ambrogio, 4,135,264, Cl. 5-45.000.

B. F. Goodrich Company, The: *See*—
Sweet, David B., 4,136.295, Cl. 310-239.000.
Tenney, Linwood P.; and Lane, Parley C., Jr., 4,136,247, Cl. 526-283.000.
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Matthews, Thomas A., 4,135,348, Cl. 54-24.000.

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Mackenzie, Kenneth J., 4,135,739, Cl. 285-22.000.

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Bouy, Pierre; Bachot, Jean; and Bourgeois, Jean-Luc, 4,135,996, Cl. 204-98.000.

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Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.

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Akkerman, Neil H.; and Foster, Stephen R., 4,135,547, Cl. 137-315.000.

Baker, Robert W. Swimming pool fluid distribution system. 4,135,549, Cl. 137-552.000.

Bakken, Daniel A.; Henderson, Robert A.; and Tischler, Edward J., to Ecodyne Corporation. Liquid treatment apparatus. 4,136,032, Cl. 210-278.000.

Bakshi, Kiran R., to Chevron Research Company. Process for preparing glycolic acid from formaldehyde using acetic acid. 4,136,112, Cl. 562-518.000.

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Gersch, Karl H., 4,135,575, Cl. 165-171.000.

Baldwin, Richard D.; and Edwards, Stanley E., to Lindeman (Holdings) Limited. Liquid dispensing tap. 4,135,649, Cl. 222-511.000.

Ballard, Clifford P., Jr., to United States of America, Energy. Glass-ceramic composition for hermetic seals. 4,135,936, Cl. 106-39.600.

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Balmat, Jean L., to Du Pont de Nemours, E. I., and Company. Rhodium recovery from hydroformylation still heel with triaryl phosphite ligand. 4,135,911, Cl. 75-0.5AB.

Balon, Gary D., to AMP Incorporated. Wire feeding means. 4,135,378, Cl. 72-14.000.

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Barber-Colman Company: *See*—
Haug, Edward W.; and Beck, Charles E., 4,135,414, Cl. 76-101.00A.

Bareis, Alfred; and Braun, Reinhard, to L. Schuler GmbH. Press arrangement. 4,135,446, Cl. 100-257.000.

Barnby, Donald W. Water squirt toy and fill valve combination. 4,135,559, Cl. 141-18.000.

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Barnes, John O.: *See*—
Barnes, Carl K.; and Barnes, John O., 4,135,447, Cl. 101-177.000.

Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., to Helena Rubinstein, Inc. Skin lightening composition. 4,136,166, Cl. 424-62.000.

Barrett, James H.: *See*—
Reed, Samuel F.; and Barrett, James H., 4,136,067, Cl. 521-32.000.

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Scharre, Normann; and Bartel, Siegfried, 4,135,802, Cl. 354-275.000.

Barth, Gerald D., to Illinois Tool Works Inc. Tiltable terminal clamp assembly. 4,135,777, Cl. 339-246.000.

Barth, John W., to Allis-Chalmers Corporation. Chassis oscillation control on an articulated vehicle. 4,135,597, Cl. 180-139.000.

Bartman, Daniel A. Device for taking up slack and securing cables, chain members or the like. 4,135,834, Cl. 403-44.000.

Bartmann, Bernhard, to J.M. Voith GmbH. Roll-changing device for web winding apparatus. 4,135,674, Cl. 242-64.000.

Bartoli, Giampaolo: *See*—
Godet, Jean-Yves; and Bartoli, Giampaolo, 4,136,229, Cl. 428-537.000.

BASF Aktiengesellschaft: *See*—
Epple, Gerhard, 4,136,100, Cl. 260-377.000.
Fikentscher, Rolf; Glaser, Klaus; Gotsmann, Guenther; and Streit, Werner, 4,135,992, Cl. 204-55.00R.
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,135,909, Cl. 71-86.000.
Zinke-Allmang, Helmut; and Scheidmeir, Walter, 4,136,124, Cl. 568-591.000.

Bates, Erwin F.: *See*—
Snyder, Michael D.; and Bates, Erwin F., 4,135,630, Cl. 214-1.0BT.

Bauer, Udo; Nothdurft, Jurgen; and Langer, Willi, to Klein, Schanzlin & Becker Aktiengesellschaft. Method of cushioning commodities in containers with foamed in place cellular plastic material. 4,136,141, Cl. 264-45.200.

Baumann, Dieter; and Rembold, Heinz, to Ciba-Geigy Corporation. Curable epoxide resin mixtures. 4,136,086, Cl. 528-99.000.

Bayer Aktiengesellschaft: *See*—
Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, 4,136,089, Cl. 528-309.000.
Borger, Gotz-Gerald; Jonas, Adam; and Germerdonk, Rolf, 4,135,891, Cl. 55-59.000.
Gallus, Manfred L.; and Stupp, Hermann-Josef, 4,135,673, Cl. 242-18.100.
Maurer, Fritz; Fuchs, Reiner A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,136,176, Cl. 424-200.000.
Mazanek, Jan; and Blahak, Johannes, 4,136,091, Cl. 260-455.00R.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,136,187, Cl. 424-266.000.

BBC Brown, Boveri & Company, Limited: *See*—
Koch, Wilhelm; and Jund, Hans, 4,135,453, Cl. 105-131.000.
Nagel, Hartmut; and Perkins, Roger, 4,135,953, Cl. 148-103.000.

Beale, Elden C. Weeding rod unit for plows. 4,135,581, Cl. 172-142.000.

Beauhaire, Pierre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Connection bar for optical fibres. 4,135,782, Cl. 350-96.210.

Beaumont, Thomas N.; Robinson, Norman; and Quinton, Geoffrey N., to Fisons Limited. Phosphoric acid production. 4,136,151, Cl. 423-166.000.

Beaver, Bryan. Skateboard. 4,135,726, Cl. 280-87.04A.

Beck, Charles E.: *See*—
Haug, Edward W.; and Beck, Charles E., 4,135,414, Cl. 76-101.00A.

Becker, Clarence A. Bulldozer blade. 4,135,583, Cl. 172-802.000.

Beckman Instruments, Inc.: *See*—
Conn, Thomas E.; and Grilli, Victor J., 4,135,660, Cl. 233-26.000.
Hall, James K., 4,135,789, Cl. 350-343.000.

Beecham Group Limited: *See*—
Buckle, Derek R.; and Smith, Harry, 4,136,192, Cl. 424-281.000.
Cassidy, Frederick; and Lake, Antony W., 4,136,190, Cl. 424-274.000.

Beery, John C.; Huston, Harvey L.; and Signature Systems, Inc. Multistate wow and flutter reduction system and method. 4,136,364, Cl. 360-28.000.

Behrenz, Wolfgang: *See*—
Maurer, Fritz; Fuchs, Reiner A.; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,136,176, Cl. 424-200.000.

Bell, Guido: *See*—
Auracher, Franz; and Bell, Guido, 4,136,212, Cl. 427-38.000.

Bell Telephone Laboratories, Incorporated: *See*—
Brews, John R.; and Kahng, Dawon, 4,135,289, Cl. 29-571.000.
Feit, Eugene D.; and Wurtz, Marguerite E., 4,136,225, Cl. 428-201.000.
McCullough, Harold E., 4,136,275, Cl. 219-230.000.
Tien, Ping K., 4,136,350, Cl. 357-16.000.
Tompsett, Michael F., 4,136,335, Cl. 340-347.0AD.

Belli, Frank G., to Xerox Corporation. Migration imaging process in which latent image is set. 4,135,926, Cl. 96-1.0PS.

Beloit Corporation: *See*—
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., 4,136,018, Cl. 209-13.000.

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Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Bender, Robert, to Stake Technology Ltd. Method of treating lignocellulose materials to produce ruminant feed. 4,136,207, Cl. 426-510.000.

Bendix Autolite Corporation: *See—*
Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., 4,136,000, Cl. 204-195.00S.

Benedek, Gyorgy; and Hornung, Peter, to Hajtomuvek es Festoberendezesek Gyara. Apparatus for the electrostatic coating of workpieces. 4,135,667, Cl. 239-697.000.

Benedict, Robert P., to Westinghouse Electric Corp. Device for monitoring phase proportions of a single component fluid. 4,135,387, Cl. 73-53.000.

Benson, Carl F., to Torrington Company, The. Universal joint. 4,135,372, Cl. 64-17.0SP.

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Benson, Philip A.; Haire, Thomas A.; Desher, Elmer J.; and Carpenter, Herbert L., Jr., to Greif Bros. Corporation. Fiber drum and locking rim assembly. 4,135,657, Cl. 229-5.700.

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Olszewski, Egon; and Hanert, Eckehard, 4,135,380, Cl. 72-306.000.

Berardi, Jim A.: *See—*
Westphal, Bruce D.; and Berardi, Jim A., 4,136,392, Cl. 364-492.000.

Berdahl, C. Martin: *See—*
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Berdnik, Valery V.: *See—*
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.

Berger, Sidney E., to Union Carbide Corporation. Polyester composites. 4,136,080, Cl. 260-40.00R.

Beriger, Ernst: *See—*
Boger, Manfred; Beriger, Ernst; Drabek, Jozef; Durr, Dieter; and Rufenacht, Kurt, 4,136,106, Cl. 260-456.00A.

Berkel, James A., Jr., to Caterpillar Tractor Co. Load indicators for construction vehicles. 4,135,632, Cl. 214-761.000.

Bernardi, Carl E.: *See—*
Ross, John P.; and Bernardi, Carl E., 4,135,557, Cl. 140-105.000.

Bernholdt, Harry F.: *See—*
Murphy, Robert E.; and Bernholdt, Harry F., 4,136,203, Cl. 426-124.000.

Bernolak, Kalman; and Meszaros, Sandor, to Medicor Muvek. X-ray light divider. 4,135,785, Cl. 350-172.000.

Bertolacini, Ralph J.; and Kim, Dae K., to Standard Oil Company of Indiana. Catalyst and hydrocarbon conversion process. 4,136,060, Cl. 252-455.00R.

Bertram, James T.; Segal, Steven A.; and Segal, Arthur R., to North American Products Corp. Quiet running circular saw blade. 4,135,421, Cl. 83-835.000.

Betz Laboratories, Inc.: *See—*
Brehm, Gary A., 4,136,050, Cl. 252-88.000.
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,136,152, Cl. 423-242.000.

Bexford Limited: *See—*
Mann, David R., 4,135,932, Cl. 96-87.00R.

Beyl, Jean J. A. Safety ski binding with boot-clamping movable plate. 4,135,735, Cl. 280-618.000.

Biancale, Vito. Quarry operation. 4,135,762, Cl. 299-13.000.

Bianchini, Pierluigi: *See—*
Filippini, Umberto; and Bianchini, Pierluigi, 4,135,661, Cl. 235-132.00R.

BICC Limited: *See—*
Poole, Michael J., 4,136,132, Cl. 260-827.000.

Bice, Archie R.; and Burchett, Donald K., to Du Pont de Nemours, E. I., and Company. Extrusion process for recovery of polymers from their dispersions in liquids. 4,136,251, Cl. 528-486.000.

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Maus, Dieter; and Buck, Hermann, 4,135,420, Cl. 83-371.000.

Bier, Kenneth C.; and Miller, Robert J., to Colt Industries Operating Corp. Apparatus and system for controlling the air-fuel ratio supplied to a combustion engine. 4,135,482, Cl. 123-119.0EC.

Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Molded articles of crystalline poly (ethylene/alkylene) terephthalates which crystallize rapidly. 4,136,089, Cl. 528-309.000.

Bill, Robert C.; and Ludwig, Lawrence P., to United States of America, National Aeronautics and Space Administration. Composite seal for turbomachinery. 4,135,851, Cl. 415-174.000.

Billault, Pierre, to Essilor International Cie Generale d'Optique. Machines for surfacing lenses. 4,135,890, Cl. 51-124.00L.

Billy the Kid, Inc.: *See—*
Breck, Louis W., Jr., 4,135,707, Cl. 270-52.000.

Binsack, Rudolf: *See—*
Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, 4,136,089, Cl. 528-309.000.

Binstock, Morton H.; and Stern, Bertram H., to Westinghouse Electric Corp. Control system for variable pitch axial fan for utility boiler. 4,135,854, Cl. 416-37.000.

Bio/Data Corporation: *See—*
Kent, Frederick M.; and Sokol, Michael, 4,135,818, Cl. 356-39.000.

Bio-Dynamics Inc.: *See—*
McNeil, Mark D.; Goldstein, Robert H.; Stahl, Robert M.; and Piepho, Sandra L., 4,135,883, Cl. 422-72.000.

Bio-Rad Laboratories, Inc.: *See—*
Mangiardi, Vito J.; Jeong, Henry J.; and Lewin, Nathan, 4,135,880, Cl. 23-230.00B.

Biotest-Serum-Institut GmbH: *See—*
Bonhard, Klaus; Boysen, Uwe; and Schleubner, Hans, 4,136,093, Cl. 260-112.50R.

Biotteau, Gerard, to Societe Anonyme Manufacture Francaise des Chaussures Eram. Automatic guiding device for the workpiece on a sewing machine. 4,135,460, Cl. 112-153.000.

Bisa, Karl; and Bisa, Thomas. Aerosol dispersion of microorganisms to eliminate oil slicks. 4,136,024, Cl. 210-11.000.

Bisa, Thomas: *See—*
Bisa, Karl; and Bisa, Thomas, 4,136,024, Cl. 210-11.000.

Bishop, Bruce J.; and Moon, Allen J., to Star Chemicals, Inc. Emulsifier-solvent scour composition and method of treating textiles therewith. 4,135,878, Cl. 8-139.000.

Bishop, Walton B., to United States of America, Navy. Sequential probability ratio test for friend identification system. 4,136,340, Cl. 343-5.0DP.

Black and Decker Manufacturing Company, The: *See—*
Alessio, Lorenzo E., 4,135,411, Cl. 74-417.000.

Blackmer, David E.; and Jaeger, C. Rene, to DBX, Inc. Adaptive signal weighting system. 4,136,314, Cl. 328-167.000.

Blahak, Johannes: *See—*
Mazanek, Jan; and Blahak, Johannes, 4,136,091, Cl. 260-455.00R.

Blank, Rudolf; and Kluczynski, Achim, to AGFA-Gevaert AG. Flat strip spool having a core provided with strip fastening means. 4,135,680, Cl. 242-74.000.

Blanning, Robert B.: *See—*
Heffner, Roy W.; and Blanning, Robert B., 4,136,343, Cl. 343-117.00R.

Blaska, Rudolf: *See—*
Arnason, Tomas; and Blaska, Rudolf, 4,136,003, Cl. 204-247.000.

Blieden, Harry R.; and MacDonald, Roderick W., to Atlantic Richfield Company. Light collector. 4,135,537, Cl. 136-89.0PC.

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Hughes, John J.; Lis, Theodore F.; Turner, John W.; and Bliss, Joseph P., 4,135,848, Cl. 408-239.00A.

Blum, Alvin S. Tomographic apparatus and method. 4,136,283, Cl. 250-363.00S.

Blumental, Raphael, to Elscint Ltd. Apparatus for examining a body by means of penetrating radiation. 4,136,284, Cl. 250-445.00T.

Bober, Heinrich; and Hollenstein, Othmar, to Peruhag A.G. Device for electrolytically applying a metal coat onto a cylinder-shaped body. 4,136,002, Cl. 204-225.000.

Bode, James D.: *See—*
Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., 4,136,000, Cl. 204-195.00S.

Boehringer Ingelheim GmbH: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,136,185, Cl. 424-251.000.

Boehringer Mannheim GmbH: *See—*
Haeckel, Rainer; Oellerich, Michael; Heerdt, Ruth; Hubner, Manfred; and Kuhnle, Hans, 4,136,196, Cl. 424-319.000.
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Hansen, Karl A.; and Hendrickson, I. Glen, 4,135,379, Cl. 72-56.000.

Boeing Company, The: *See—*
Duryea, Josiah T., 4,135,476, Cl. 118-259.000.

Boger, Manfred; Beriger, Ernst; Drabek, Jozef; Durr, Dieter; and Rufenacht, Kurt, to Ciba-Geigy Corporation. 1,3,5-Triazapenta-1,4-diene sulfonate esters. 4,136,106, Cl. 260-456.00A.

Bogese, Stephen B., II, to Virginia Plastics Company. Plastic guy wire guard and method of making and using same. 4,135,336, Cl. 52-147.000.

Bogeso, Klaus P.; and Toft, Anders S., to Kefalas A/S. Anti-depressive substituted 1-dimethylaminopropyl-1-phenyl phthalans. 4,136,193, Cl. 424-285.000.

Bogomolov, Boris N.; Kiselev, Anatoly V.; and Malafeev, Alexandr N. Apparatus for dehydration of continuously fed flow of suspension. 4,136,035, Cl. 210-388.000.

Bollinger, John C.: *See—*
Galberth, Robert L.; Arnold, Roy L.; and Bollinger, John C., 4,136,309, Cl. 320-2.000.

Bomers, Johannes P., to Oce-van der Grinten N.V. Apparatus for applying liquid to sheetlike material. 4,135,475, Cl. 118-249.000.

Bone, Everett W. DC Trouble lamp. 4,136,381, Cl. 362-311.000.

Bonhard, Klaus; Boysen, Uwe; and Schleubner, Hans, to Biotest-Serum-Institut GmbH. Hemoglobin preparation with increased oxygen release. 4,136,093, Cl. 260-112.50R.

Bopp, Barbara A.: *See—*
Dren, Anthony T.; and Bopp, Barbara A., 4,136,183, Cl. 424-248.560.

Borchert, Werner: *See—*
Treplin, Friedrich-Wilhelm; and Borchert, Werner, 4,135,574, Cl. 165-95.000.

Borgen, Jennings O. Method and means for reversible sterilization. 4,135,495, Cl. 128-1.00R.

Borger, Gotz-Gerald; Jonas, Adam; and Germerdonk, Rolf, to Bayer

Aktiengesellschaft. Purifying exhaust gases containing organic and inorganic materials. 4,135,891, Cl. 55-59.000.

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MacQuilkin, Arthur E.; Kulousek, Elmer J.; and Borre, Earl A., 4,135,640, Cl. 220-316.000.

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Bosnjak, Milovan, to Buttes Gas & Oil Co. Process for drying beet pulp. 4,135,309, Cl. 34-14.000.

Bossert, Friedrich: *See*—
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,136,187, Cl. 424-266.000.

Bosshard, Werner: *See*—
Hurlemann, Ernst; and Bosshard, Werner, 4,135,434, Cl. 89-181.000.

Bott, Helmuth; and Nothacker, Siegfried, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Armrest for passengers of motor vehicles. 4,135,759, Cl. 296-153.000.

Boudart, Michel; and Lam, Yiu-Lau, to Leland Stanford Junior University, The Board of Trustees of. Highly active Pd-Au catalyst. 4,136,062, Cl. 252-460.000.

Bouman, Antonius F. M.: *See*—
Mulder, Willem; Bouman, Antonius F. M.; and Zwarts, Johan M. C., 4,136,341, Cl. 343-17.2PC.

Bourde, Michel, to CGEE Alstlom S.A. Filtering device for high-voltage power lines used as high-frequency transmission media. 4,136,319, Cl. 333-1.000.

Bourelier, Claude; Orain, Roger; Pelzer, Rudolf; Schaefer, Wolfgang; and Schindler, Siegfried, to Saint-Gobain Industries. Method of forming film. 4,136,214, Cl. 427-169.000.

Bourgeois, Jean-Luc: *See*—
Bouy, Pierre; Bachot, Jean; and Bourgeois, Jean-Luc, 4,135,996, Cl. 204-98.000.

Bouwman, Aries, to Drost Machines B.V. Plant extractor. 4,135,580, Cl. 171-61.000.

Bouy, Pierre; Bachot, Jean; and Bourgeois, Jean-Luc, to Rhone-Poulenc Industries. Selective diaphragm for electrolysis. 4,135,996, Cl. 204-98.000.

Bowe Bohler & Weber KG: *See*—
Fuhring, Heinrich; and Steitz, Winfried, 4,135,310, Cl. 34-52.000.

Boysen, Uwe: *See*—
Bonhard, Klaus; Boysen, Uwe; and Schleubner, Hans, 4,136,093, Cl. 260-112.50R.

Brackmann, Warren A.; and Hrboticky, Karel, to Rothmans of Pall Mall Canada Limited. Tobacco feeding system. 4,135,615, Cl. 198-371.000.

Bradley, David D., to General Binding Corporation. Lamination trimming device. 4,135,300, Cl. 30-293.000.

Brady, Donnie G., to Phillips Petroleum Company. Flame-retardant polyolefins. 4,136,082, Cl. 260-45.9AD.

Braga, Albert T.; Brenner, Robert A.; and Cuthbert, Victor W., to Whirlpool Corporation. Waste disposer mounting apparatus. 4,135,258, Cl. 4-187.00A.

Braid, Milton, to Mobil Oil Corporation. Lubricant composition containing esters of arylaminophenoxyalkyl carboxylic acids. 4,136,044, Cl. 252-51.50A.

Braitberg, Michael F., to Honeywell Inc. Method for making a holographic tone wheel for use in a sync-off-tach tape drive system. 4,136,347, Cl. 346-151.000.

Brangenberg, Egidius. Ski safety device. 4,135,729, Cl. 280-11.37E.

Braun, Reinhard: *See*—
Bareis, Alfred; and Braun, Reinhard, 4,135,446, Cl. 100-257.000.

Braunhut, Harold N. Spring whip. 4,135,719, Cl. 273-84.00R.

Breck, Louis W., Jr., to Billy the Kid, Inc. Apparatus and method for collating and bundling belt loops. 4,135,707, Cl. 270-52.000.

Brehm, Gary A., to Betz Laboratories, Inc. Dust suppression method and composition. 4,136,050, Cl. 252-88.000.

Brennan, James K.: *See*—
Lichtman, Marshall A.; and Brennan, James K., 4,135,975, Cl. 195-1.800.

Brenner, Robert A.: *See*—
Braga, Albert T.; Brenner, Robert A.; and Cuthbert, Victor W., 4,135,258, Cl. 4-187.00A.

Brews, John R.; and Kahng, Dawon, to Bell Telephone Laboratories, Incorporated. Method for producing a buried junction memory device. 4,135,289, Cl. 29-571.000.

Bridges, Edward B.; and Bridges, Lillian K. Portable, wheeled electric sprayer with pressurized liquid reservoir. 4,135,669, Cl. 239-373.000.

Bridges, Lillian K.: *See*—
Bridges, Edward B.; and Bridges, Lillian K., 4,135,669, Cl. 239-373.000.

Briese, Wolfgang, to International Standard Electric Corporation. Four corner piezoelectric crystal support. 4,136,297, Cl. 310-353.000.

British-American Tobacco Company Limited: *See*—
Luke, John A.; and Haslam, Fred, 4,135,523, Cl. 131-261.00B.

Britt, Herbert I.: *See*—
Kamm, Gerard R.; Milks, David; Kearns, James D.; Britt, Herbert I.; and Khavarian, Cyrus R., 4,136,015, Cl. 208-129.000.

Broadhead, Gordon K.: *See*—
Tamblyn, Robert T.; Rose, James W. S.; Silverthorne, Paul N.; and Broadhead, Gordon K., 4,135,571, Cl. 165-18.000.

Brody, Thomas P.: *See*—
Luo, Fang-Chen; and Brody, Thomas P., 4,135,959, Cl. 156-230.000.

Broemer, Heinz: *See*—
Pfeil, Emanuel; and Broemer, Heinz, 4,135,935, Cl. 106-35.000.

Brohn, Fredrick H.: *See*—
Clarkson, Allen B., Jr.; and Brohn, Fredrick H., 4,136,198, Cl. 424-320.000.

Brooks, Carson L., to Reynolds Metals Company. Shield for electromagnetic continuous casting system. 4,135,568, Cl. 164-147.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hishida, Yukio; Asai, Yuichi; Kondo, Toshikatsu; Asai, Akira; Sakaida, Atsuo; and Miyazawa, Chiaki, 4,135,830, Cl. 400-124.000.

Brown, Averil L. Panel carrier and handling device. 4,135,655, Cl. 224-45.00M.

Brown, Boveri & Co. Ltd.: *See*—
Baechler, Urs; and Riondel, Pierre, 4,136,304, Cl. 318-372.000.

Brown, Donald D.; and Trindle, Terry L., to Kelsey-Hayes Co. Magnet support for an electric brake. 4,135,607, Cl. 188-161.000.

Brown, Francis B.; Erickson, John W.; and Petrie, Harold L., to Kobe, Inc. Jet pump with ceramic venturi. 4,135,861, Cl. 417-183.000.

Brown, Jack, to Singer Company, The. X-Y Patterning by electronically controlled household sewing machine. 4,135,462, Cl. 112-158.00E.

Brown, Robert L., to United States of America, Energy. Winding a multi-pancake magnet from a continuous conductor. 4,135,294, Cl. 29-605.000.

Brown & Root, Inc.: *See*—
Blight, Graham J.; and Djie, Hien T., 4,135,842, Cl. 405-209.000.

Bruckl, Konrad: *See*—
Thate, Kurt; and Bruckl, Konrad, 4,135,698, Cl. 251-61.100.

Brumm, Richard S., to Grove Valve and Regulator Company. Low pressure pilot valve. 4,135,697, Cl. 251-50.000.

Buccigross, Henry L.: *See*—
Doggett, Roger H.; and Buccigross, Henry L., 4,136,078, Cl. 260-33.20R.

Buchanan, Russell A., to United States of America, Agriculture. Extraction of rubber or rubberlike substances from fibrous plant materials. 4,136,131, Cl. 260-816.00G.

Buck, Hermann: *See*—
Maus, Dieter; and Buck, Hermann, 4,135,420, Cl. 83-371.000.

Buckle, Derek R.; and Smith, Harry, to Beecham Group Limited. 4-Hydroxy-3-nitro (cyano) coumarins. 4,136,192, Cl. 424-281.000.

Budzich, Tadeusz. Load responsive system pump controls. 4,135,365, Cl. 60-445.000.

Bundy, Gordon L., to Upjohn Company, The. 5,9α-Imino- or 6,9α-iminomethylene-9-deoxy-PGF_1 compounds. 4,136,095, Cl. 546-112.000.

Buono, Frederick J.; and Woods, William B., to Tenneco Chemicals, Inc. Pigment dispersions containing polyoxymethyleneoxazolidine biocides. 4,135,945, Cl. 106-308.00N.

Burchett, Donald K.: *See*—
Bice, Archie R.; and Burchett, Donald K., 4,136,251, Cl. 528-486.000.

Burns, Michael E.: *See*—
Pracht, Hans J.; and Burns, Michael E., 4,136,038, Cl. 252-8.800.

Burroughs Corporation: *See*—
DeMoss, Dean L.; and Ragle, Herbert U., 4,136,368, Cl. 360-98.000.

Burroughs Wellcome Co.: *See*—
Rideout, Janet E.; Miller, Richard L.; and Elion, Gertrude B., 4,136,175, Cl. 424-180.000.

Burwell, Anson C., Jr.; and Decker, John J., to GTE Sylvania Incorporated. Method of determining electrolyte leakage in hermetically sealed electrochemical cell. 4,135,384, Cl. 73-40.700.

Burynin, Vitaly A.: *See*—
Chazov, Evgeny I.; Ruda, Mikhail Y.; Burynin, Vitaly A.; and Lokshin, Moisei A., 4,135,496, Cl. 128-1.00D.

Burzin, Klaus; and Ruter, Jorn, to Chemische Werke Huels, A.G. Process for the production of cyclic esters of undecanedioic acid. 4,136,098, Cl. 260-343.000.

Bushnell, Calvin L.: *See*—
Jalan, Vinod M.; and Bushnell, Calvin L., 4,136,059, Cl. 252-447.000.

Busick, Eugene D. Air lift pump energy conversion apparatus. 4,135,364, Cl. 60-325.000.

Busnelli, Ambrogio, to B & B Italia S.p.A. Divan or easy chair convertible into a made bed. 4,135,264, Cl. 5-45.000.

Butler, Edward J., Jr. Gas tank measuring and closure device. 4,135,404, Cl. 73-426.000.

Butorin, Leonid M.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Buttes Gas & Oil Co.: *See*—
Bosnjak, Milovan, 4,135,309, Cl. 34-14.000.

Butticci, Donald E., personal representative: *See*—
Butticci, Donate, deceased; and Butticci, Donald E., personal representative, 4,135,706, Cl. 269-82.000.

Butticci, Donate, deceased; and Butticci, Donald E., personal representative. Workpiece holding assembly. 4,135,706, Cl. 269-82.000.

Bykov, Pavel A.: *See—*
Barbakadze, Dzhondo F.; Zamechnik, Frants F.; Popov, Vladimir F.; and Bykov, Pavel A., 4,135,920, Cl. 75-130.00R.
Cabak, James E. Mixing apparatus. 4,135,828, Cl. 366-197.000.
Cain, George R.; Gidick, Ward F.; and Edgar, William D., to Koppers Company, Inc. One-spot rotary coke quenching car. 4,135,986, Cl. 202-227.000.
Calspan Corporation: *See—*
Pilie, Roland J.; and Dahm, Douglas B., 4,136,010, Cl. 210-164.000.
Calvin, John N., to Combustion Engineering, Inc. Hydraulic hold-down for nuclear reactor fuel. 4,135,971, Cl. 176-50.000.
Cambern, Bruce P., to Ford Motor Company. Tamper-proof seatbelt system. 4,136,328, Cl. 340-52.00E.
Camco, Incorporated: *See—*
Tausch, Gilbert H., 4,135,576, Cl. 166-117.500.
Camerik, Eduard, to U.S. Philips Corporation. Video disc player. 4,135,721, Cl. 274-1.00D.
Campagnolo, Tullio. Mounting of the transmission chain of bicycles. 4,135,727, Cl. 280-236.000.
Campana, Patsie C. Refractory article and method of making the same. 4,135,939, Cl. 106-68.000.
Campbell, Joseph M., to Teledyne Industries, Inc. Circuit for controlling the expression of an electronically controlled keyboard instrument. 4,135,428, Cl. 84-1.240.
Campbell Soup Company: *See—*
Egee, Walter W.; and Cramer, Clarence W., 4,135,345, Cl. 53-55.000.
Canada Wire & Cable Limited: *See—*
Dudley, Michael A., 4,136,074, Cl. 260-29.2EP.
Canadian Industries Limited: *See—*
Lang, Leslie C., 4,135,450, Cl. 102-23.000.
Canadian Patents & Development Limited: *See—*
Vermeulen, Frederick E.; and Chute, Frederick S., 4,136,014, Cl. 208-11.0LE.
Canaris, Valerie M.; and Willis, William J., to R. O. Hull & Company, Inc. Bath and method for electroplating tin and/or lead. 4,135,991, Cl. 204-43.00S.
Candlin, John P.; and Segal, John A. A. A. G., to Imperial Chemical Industries Limited. Transition metal composition. 4,136,057, Cl. 252-429.00B.
Candor, James T. Method and apparatus for removing liquid from liquid bearing material. 4,135,307, Cl. 34-1.000.
Canon Kabushiki Kaisha: *See—*
Ikemori, Keiji, 4,135,786, Cl. 350-184.000.
Masunaga, Makoto; Hosoe, Kazuya; Tsunekawa, Tokuichi; Tamura, Shuichi; and Yokota, Hideo, 4,135,815, Cl. 356-4.000.
Sunouchi, Akio; Kozuki, Susumu; and Watanabe, Yoshiaki, 4,135,801, Cl. 354-214.000.
Capdevila, Claudio; Juan, Francois A.; Venditti, Gaetan; and Alquier, Michel E. L. Molding machine more particularly for the manufacture of square-shaped construction elements. 4,135,695, Cl. 249-118.000.
Capone, David M., to Thermo-Lab Instruments, Inc. Apparatus for developing a counterflow to clean a fluid conveying conduit of a gas analyzer. 4,135,382, Cl. 73-23.000.
Capozza, Richard C., to Alza Corporation. Polymeric orthoesters having arylene arrangement. 4,136,252, Cl. 528-403.000.
Carboline Company: *See—*
Wheeler, John P., 4,136,147, Cl. 264-261.000.
Carborundum Company, The: *See—*
Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., 4,135,937, Cl. 106-44.000.
Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., 4,135,938, Cl. 106-44.000.
Carl Manufacturing Co., Ltd.: *See—*
Mori, Chuzo, 4,135,319, Cl. 40-389.000.
Carl Schleicher & Schull: *See—*
Cosack, Klaus; Hein, Wolfgang; and Neumann, Manfred, 4,136,029, Cl. 210-242.00R.
Carle & Montanari S.p.A.: *See—*
Cerboni, Renzo, 4,135,619, Cl. 198-477.000.
Cerboni, Renzo, 4,135,872, Cl. 425-453.000.
Carondelet Foundry Company: *See—*
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Carpenter, Herbert L., Jr.: *See—*
Benson, Philip A.; Haire, Thomas A.; Desher, Elmer J.; and Carpenter, Herbert L., Jr., 4,135,657, Cl. 229-5.700.
Carrier Corporation: *See—*
Watson, James J., Jr., 4,135,740, Cl. 285-22.000.
Carson, Forrest L.; and Rives, Joe F., to J. M. Huber Corporation. Pollution control device adapted for attachment to reservoir gland stuffing boxes. 4,135,859, Cl. 417-9.000.
Case, Cecil L.: *See—*
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,135,444, Cl. 100-50.000.
Casey, John A.; and Rojas, Ismael E. Process and apparatus for enhancing growth of precipitables in a chemical solution. 4,135,946, Cl. 127-11.000.
Casler, Richard J., Jr.: *See—*
Eterno, John S.; and Casler, Richard J., Jr., 4,136,391, Cl. 364-478.000.
Cassidy, Frederick; and Lake, Antony W., to Beecham Group Limited. 4,4-Dimethyl-3,5-pyrrolidinediones. 4,136,190, Cl. 424-274.000.
Castellano, Carmine T.: *See—*
Grillo, Richard J.; and Castellano, Carmine T., 4,135,829, Cl. 366-337.000.
Caswell, Robert L.; and Griffith, Glen R., to Rockwell International Corporation. Micro-programmable data terminal. 4,136,400, Cl. 364-900.000.
Caterpillar Tractor Co.: *See—*
Berkel, James A., Jr., 4,135,632, Cl. 214-761.000.
Lorimor, Larry W., 4,135,541, Cl. 137-116.300.
Morley, Roy D., 4,135,360, Cl. 59-7.000.
Smith, Roger M.; and Freese, Gary P., 4,135,584, Cl. 172-804.000.
Caunt, Anthony D.: *See—*
Appleyard, George D.; Caunt, Anthony D.; Fortuin, Michael S.; and Heggs, Thomas G., 4,136,243, Cl. 526-139.000.
Caveney, Jack E.; and Moody, Roy A., to Panduit Corp. Cable tie. 4,135,749, Cl. 292-317.000.
Cawood, Robert N. Constant force spring expandable clasp-holder. 4,135,626, Cl. 211-43.000.
Cebulak, Walter S., to Aluminum Company of America. Metal article and powder alloy and method for producing metal article from aluminum base powder alloy containing silicon and manganese. 4,135,922, Cl. 75-143.000.
Cedco, Inc.: *See—*
Warczak, Russell C., 4,135,677, Cl. 242-72.00B.
Celanese Corporation: *See—*
Hwang, H. Shinn; and Taylor, Paul D., 4,136,104, Cl. 260-449.00R.
Celtite, Inc.: *See—*
Plaisted, Anthony C., 4,136,134, Cl. 260-861.000.
Central Glass Co., Ltd.: *See—*
Suzuki, Takeshi; Murao, Mikio; Utiyama, Susumu; Hatanaka, Kyohei; and Inoue, Hajime, 4,135,904, Cl. 65-27.000.
Centrifugal & Mechanical Industries, Inc.: *See—*
Derton, Harry E.; and Cope, Dewey M., 4,135,659, Cl. 233-3.000.
Cerboni, Renzo, to Carle & Montanari S.p.A. Apparatus for transferring confectionery products from a feeding conveyor to a receiving conveyor. 4,135,619, Cl. 198-477.000.
Cerboni, Renzo, to Carle & Montanari S.p.A. Supporting device for pouring dies, in particular for pouring dies used in plants for making chocolate items. 4,135,872, Cl. 425-453.000.
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Coupek, Jiri; Lukas, Jaromir; Hradil, Jiri; and Krivakova, Miroslava, 4,135,892, Cl. 55-67.000.
CGEE Alstlom S.A.: *See—*
Bourde, Michel, 4,136,319, Cl. 333-1.000.
Chadda, Madan: *See—*
Tursky, Werner; Chadda, Madan; and Schafer, Horst, 4,135,291, Cl. 29-574.000.
Chan, Robert H. G.; Mann, Martin R.; and McDonnell, Francis M., to RCA Corporation. Dynamic channel allocation buffer matrix. 4,136,399, Cl. 364-900.000.
Chang, Augustine W.; and Gaind, Arun K., to International Business Machines Corporation. Method for fabricating self-aligned semiconductor devices utilizing selectively etchable masking layers. 4,135,954, Cl. 148-187.000.
Chapin, Everett E., to Chapin, Vivian G., a part interest. Rip-cross cut guide for circular saw. 4,135,419, Cl. 83-471.300.
Chapin, Vivian G.: *See—*
Chapin, Everett E., 4,135,419, Cl. 83-471.300.
Chappel, Raymond M.: *See—*
Kirk, Bradley S.; and Chappel, Raymond M., 4,136,023, Cl. 210-7.000.
Charles Bar-Lok Corp.: *See—*
Evans, Arthur A.; and Rifkin, Morton S., 4,135,376, Cl. 70-100.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Eisenhaure, David B., 4,135,361, Cl. 60-39.020.
Eterno, John S.; and Casler, Richard J., Jr., 4,136,391, Cl. 364-478.000.
Chatterjea, Probir K., to International Harvester Company. Brake operated transmission clutches with fully-resetting modulator-load-piston. 4,135,610, Cl. 192-4.00A.
Chazov, Evgeny I.; Ruda, Mikhail Y.; Burynin, Vitaly A.; and Lokshin, Moisei A., to Institut Kardiologii Imeni A.L. Myasnikova Akademii Meditsinskikh Nauk SSSR. Extracorporeal circulation apparatus. 4,135,496, Cl. 128-1.00D.
Chemie-Anlagenbau Bischofsheim GmbH: *See—*
Hilterhaus, Karl H.; Reuter, Franz G.; and Menzel, Tankred, 4,136,238, Cl. 521-107.000.
Chemische Fabrik Kreussler & Co., GmbH: *See—*
Hasenclever, Kaspar D., 4,135,879, Cl. 8-142.000.
Chemische Werke Huels, A.G.: *See—*
Burzin, Klaus; and Ruter, Jorn, 4,136,098, Cl. 260-343.000.
Cheney, Bruce R., to Litton Industrial Products, Inc. Rinsing tank. 4,135,530, Cl. 134-60.000.
Cherrington, Martin D. Apparatus for constantly rotating casing during installation. 4,135,586, Cl. 173-147.000.
Chesla, Frank J.; and Wild, Gerald K. Mishandling detector for packages. 4,135,472, Cl. 116-124.00R.
Chevali, Harihar D., to General Electric Company. Photoflash lamp array having reflector at rear of transparent circuit board. 4,136,378, Cl. 362-13.000.
Chevali, Harihar D., to General Electric Company. Photoflash lamp array having reflective circuit board. 4,136,379, Cl. 362-13.000.
Chevron Research Company: *See—*
Bakshi, Kiran R., 4,136,112, Cl. 562-518.000.
Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,135,422, Cl. 84-1.010.
Chicago Bridge & Iron Company: *See—*
DeGraaf, Douglas W., 4,135,543, Cl. 137-236.00S.
Chick, David M.; and Hawthorne, David B., to Data Recording Instru-

ment Co. Ltd. Magnetic disc storage devices having compensation for dimensional changes. 4,136,365, Cl. 360-78.000.
Chicklis, Evan P.; and Naiman, Charles S., to Sanders Associates, Inc. Multi-color, activator-activator laser. 4,136,316, Cl. 331-94.50F.
Chimera Research & Development Inc.: *See*—
Druss, Barry L., 4,135,736, Cl. 280-636.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Toth, Geza; and Toth, Istvan, 4,136,189, Cl. 424-273.00R.
Chisholm, James R. Drain device for compressed air lines. 4,135,542, Cl. 137-204.000.
Chloride Group Limited: *See*—
Cox, David F.; and Hashimoto, Tom T., 4,135,340, Cl. 52-115.000.
Foster, George W., 4,136,310, Cl. 320-37.000.
Cholez, Roger: *See*—
Naudot, Jean-Claude; and Cholez, Roger, 4,136,326, Cl. 340-15.5DP.
Chrislock, Jerry L., to United States of America, Energy. Backlash compensator mechanism. 4,135,412, Cl. 74-441.000.
Christenson, Roger M.: *See*—
Zwack, Robert R.; and Christenson, Roger M., 4,136,025, Cl. 210-23.00H.
Christoffers, Dirk: *See*—
Niemann, Ernst-Georg; Christoffers, Dirk; and Georgi, Bernd, 4,135,816, Cl. 356-317.000.
Chu, Cheuk S., to Yip Hing Camping Goods Manufactury Limited. Rucksack frame. 4,135,654, Cl. 224-25.00A.
Chugai Seiyaku Kabushiki Kaisha: *See*—
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; Sasaki, Kanemichi; and Hasegawa, Kouji, 4,136,191, Cl. 424-279.000.
Chute, Frederick S.: *See*—
Vermeulen, Frederick E.; and Chute, Frederick S., 4,136,014, Cl. 208-11.0LE.
Ciba-Geigy AG: *See*—
Ridley, Kenneth A., 4,135,477, Cl. 118-325.000.
Ciba-Geigy Corporation: *See*—
Baumann, Dieter; and Rembold, Heinz, 4,136,086, Cl. 528-99.000.
Boger, Manfred; Beriger, Ernst; Drabek, Jozef; Durr, Dieter; and Rufenacht, Kurt, 4,136,106, Cl. 260-456.00A.
Jager, Horst; and Wegmuller, Hans, 4,136,039, Cl. 252-8.800.
Mueller, Karl F.; and Kleiner, Eduard K., 4,136,250, Cl. 528-29.000.
Wheeler, Ian R., 4,135,944, Cl. 106-288.00Q.
Clairol Incorporated: *See*—
Rosenberg, Ira E.; Ferguson, John A.; and Loveless, Norman P., 4,135,524, Cl. 132-7.000.
Clark, Benjamin C., Jr.: *See*—
Hunter, George L. K.; and Clark, Benjamin C., Jr., 4,136,119, Cl. 260-586.00R.
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., to Beloit Corporation. Vortex separator with coaxial inlet and lightweight reject pipelines. 4,136,018, Cl. 209-13.000.
Clark, Melvin D., to Aro Corporation, The. Selectively positioned muffler. 4,135,602, Cl. 181-230.000.
Clark, Robert A., Jr., to Communication Equipment and Engineering Co. Telephone paystation. 4,136,262, Cl. 179-6.30R.
Clarke, Samuel C.; and Losinski, Edward, to InterRoyal Corporation. Adjustable angle floor support. 4,135,690, Cl. 248-188.200.
Clarkson, Allen B., Jr.; and Brohn, Fredrick H., to Rockefeller University, The. Method for the control of trypanosomiasis. 4,136,198, Cl. 424-320.000.
Clemens, Jon K.; and Ross, Michael D., to RCA Corporation. Transcoding apparatus. 4,136,358, Cl. 358-11.000.
Clements, Lloyd W., to IRECO Industries, Inc. Trail line moves. 4,135,738, Cl. 285-5.000.
Clements, Thomas W.: *See*—
Fallon, Merton R.; and Clements, Thomas W., 4,135,641, Cl. 222-1.000.
Clements, Vern E. Motorcycle touring fairing. 4,135,758, Cl. 296-78.100.
Coca-Cola Company, The: *See*—
Hunter, George L. K.; and Clark, Benjamin C., Jr., 4,136,119, Cl. 260-586.00R.
Cogas Development Company: *See*—
Roberts, Alan G., 4,135,893, Cl. 55-82.000.
Cohen, Eric S.; and Korwin, Paul. Telephone intruder alert system. 4,136,266, Cl. 179-81.00E.
Cohen, Steven R. Specific assay for active demyelinization. 4,136,160, Cl. 424-1.000.
Collins, Edward J.: *See*—
Green, David H.; Collins, Edward J.; and Sterling, Vaughn C., 4,136,376, Cl. 362-10.000.
Colt Industries Operating Corp: *See*—
Bier, Kenneth C.; and Miller, Robert J., 4,135,482, Cl. 123-119.0EC.
Columbus, Richard L., to Eastman Kodak Company. Collection and dispensing device for non-pressurized liquids. 4,136,036, Cl. 210-516.000.
Combustion Engineering, Inc.: *See*—
Anthony, Andrew J.; and Groves, Malcolm D., 4,135,972, Cl. 176-78.000.
Calvin, John N., 4,135,971, Cl. 176-50.000.
Commissariat a l'Energie Atomique: *See*—
Rosengard, Alex, 4,135,898, Cl. 55-419.000.
Communication Equipment and Engineering Co.: *See*—
Clark, Robert A., Jr., 4,136,262, Cl. 179-6.30R.
Communications Satellite Corporation: *See*—
Rittner, Edmund S., 4,135,950, Cl. 136-89.0SJ.
Compagnie Generale des Etablissements Michelin: *See*—
Durand, Pierre, 4,136,232, Cl. 429-15.000.
Massoubre, Jean-Maire, 4,136,244, Cl. 526-174.000.
Massoubre, Jean-Marie, 4,136,245, Cl. 526-174.000.
Compagnie Generale pour les Developpments Operationnels des Richesses Sous-Marines "C.G. DORIS": *See*—
Lamy, Jacques E., 4,135,844, Cl. 405-171.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Beauhaire, Pierre, 4,135,782, Cl. 350-96.210.
Compriforce AG: *See*—
Harcuba, Siegfried; and Dussa, Ewald, 4,135,620, Cl. 198-836.000.
Condie, Richard M., to University of Minnesota, The Regents of the. Preparation of intravenous human and animal gamma globulins and isolation of albumin. 4,136,094, Cl. 260-122.000.
Conn, Thomas E.; and Grilli, Victor J., to Beckman Instruments, Inc. Adjustable tube rack carrier. 4,135,660, Cl. 233-26.000.
Connolly, Douglas P.: *See*—
Forward, John E.; Muller, George A.; and Connolly, Douglas P., 4,135,642, Cl. 222-23.000.
Consolidated Cigar Corp.: *See*—
Sinclair, Robert I.; Godfrey, Frederick D., Jr.; and Fedro, John J., 4,135,962, Cl. 156-387.000.
Construction Techniques, Inc.: *See*—
Umemoto, Tomoji; and Nakamura, Yukichi, 4,135,843, Cl. 405-18.000.
Conti, Fulvio. Full-width scouring station particularly for delicate printed fabrics. 4,135,373, Cl. 68-22.00R.
Continental Group, Inc., The: *See*—
Mascia, Carmen T.; and Hasagawa, Gary K., 4,135,647, Cl. 222-211.000.
Continental Oil Company: *See*—
Fair, Delbert W., 4,135,599, Cl. 181-121.000.
Peterson, Marvin L.; and Oertle, Donald H., 4,135,386, Cl. 73-40.000.
Stafford, Jay H., 4,135,598, Cl. 181-114.000.
Zielke, Clyde W., 4,136,056, Cl. 252-415.000.
Cooper, Alan: *See*—
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,136,254, Cl. 536-10.000.
Cooper, Wayne F. Winch attachment for vehicle wheels. 4,135,681, Cl. 242-95.000.
Cope, Dewey M.: *See*—
Derton, Harry E.; and Cope, Dewey M., 4,135,659, Cl. 233-3.000.
Coppola, John A.: *See*—
Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., 4,135,937, Cl. 106-44.000.
Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., 4,135,938, Cl. 106-44.000.
Corley, Foss E.; and Richmon, Joe B., to Merck & Co., Inc. Treatment of xanthan gum to improve clarity. 4,135,979, Cl. 195-31.00P.
Cornell Research Foundation, Inc.: *See*—
Resler, Edwin L., Jr., 4,135,481, Cl. 123-119.00A.
Corning Glass Works: *See*—
Albertsen, Peter S., 4,135,741, Cl. 285-55.000.
Hudson, Marshall C., 4,135,779, Cl. 350-96.150.
Simpson, Lynn B.; and Takeguchi, Milton M., 4,135,981, Cl. 195-127.000.
Cosack, Klaus; Hein, Wolfgang; and Neumann, Manfred, to Carl Schleicher & Schull. Pressure filtration device. 4,136,029, Cl. 210-242.00R.
Cosper, David R., to Nalco Chemical Company. Glycidaldehyde modified cationic polyacrylamide polymers used in paper. 4,135,969, Cl. 162-167.000.
Cosquer, Philippe: *See*—
Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, 4,136,195, Cl. 424-304.000.
Costemalle, Bernard: *See*—
Odam, Norman E.; and Costemalle, Bernard, 4,136,219, Cl. 427-385.00B.
Cote, Paul L., to Gentex Corporation. Hand-held microphone assembly. 4,136,265, Cl. 179-146.00R.
Cotter, Byron R., to Hooker Chemicals & Plastics Corp. Separation of 2,6-dichlorobenzaldehyde from isomeric mixtures. 4,136,122, Cl. 260-599.000.
Cotter, Donald P., to Field Form, Inc. Insulated metal roofing and siding system. 4,135,342, Cl. 52-461.000.
Coughlin, John E.: *See*—
Venetta, Henry J.; Singrey, Raymond E.; and Coughlin, John E., 4,135,702, Cl. 266-44.000.
Coupek, Jiri; Lukas, Jaromir; Hradil, Jiri; and Krivakova, Miroslava, to Ceskoslovenska akademie ved. Macroporous polymeric sorbents for chromatography, especially gas chromatography of organic compounds. 4,135,892, Cl. 55-67.000.
Covington, William P., to National Car Rental System, Inc. Lightweight, disposable transportation casket. 4,135,279, Cl. 27-4.000.
Cox, David F.; and Hashimoto, Tom T., to Chloride Group Limited. Modular drill rig erection systems. 4,135,340, Cl. 52-115.000.
Cox, Samson A.; and Levert, Francis E., to United States of America, Energy. Directional detector of gamma rays. 4,136,282, Cl. 250-336.000.
Craig, Bruce G.: *See*—
Himes, Richard C.; and Craig, Bruce G., 4,135,894, Cl. 55-91.000.
Cramer, Clarence W.: *See*—
Egee, Walter W.; and Cramer, Clarence W., 4,135,345, Cl. 53-55.000.

Crivello, James V., to General Electric Company. Photoinitiators. 4,136,102, Cl. 260-440.000.

Cudworth, Richard W.: *See—*
Hunter, Edwin J.; Hunter, Richard E.; and Cudworth, Richard W., 4,135,539, Cl. 137-1.000.

Cullen, James H. Speed-control system for an engine-powered vehicle. 4,136,331, Cl. 340-53.000.

Culling, John H., to Carondelet Foundry Company. Alloy resistant to sulfuric acid corrosion. 4,135,919, Cl. 75-122.000.

Cummins Engine Company, Inc.: *See—*
Vogel, John D., 4,136,389, Cl. 364-442.000.

Currie, William E.: *See—*
Sullivan, Arthur F.; and Currie, William E., 4,135,395, Cl. 73-194.00B.

Curtiss-Wright Corporation: *See—*
Loyd, Robert W., Jr., 4,135,485, Cl. 123-242.000.

Cuthbert, Victor W.: *See—*
Braga, Albert T.; Brenner, Robert A.; and Cuthbert, Victor W., 4,135,258, Cl. 4-187.00A.

CVI Corporation: *See—*
Parish, Harold C.; Spulgis, Ivars S.; Hickey, Thomas N.; and Hoy, David R., 4,135,896, Cl. 55-270.000.

Czajkowska, Teresa: *See—*
Kulesza, Janusz; Miler, Kazimierz; Podlejski, Jerzy; Gora, Jozef; Czajkowska, Teresa; Kozlowski, Zbigniew; Kolska, Jadwiga; Stolowska, Jolanta; and Rutkowski, Zygmunt, 4,136,206, Cl. 426-431.000.

Dabbs, Phillip E.: *See—*
Gunter, Josef K.; Jones, Thomas R.; and Dabbs, Phillip E., 4,135,275, Cl. 19-107.000.

Dahle, Orvar, to ASEA Aktiebolag. Torque transducer. 4,135,391, Cl. 73-136.00A.

Dahm, Douglas B.: *See—*
Pilie, Roland J.; and Dahm, Douglas B., 4,136,010, Cl. 210-164.000.

Dahms, Ronald H., to Monsanto Company. Cold punchable laminates. 4,136,228, Cl. 428-476.000.

Dai Nippon Printing Co., Ltd.: *See—*
Minami, Kazuto; Tsukui, Norihiko; and Imamoto, Tsunehiko, 4,136,224, Cl. 428-161.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-Ya; and Ono, Shin-etu, 4,136,188, Cl. 424-273.00R.

Daimler-Benz Aktiengesellschaft: *See—*
Scholz, Hansjuergen; Jahn, Walter; and Gimbel, Juergen, 4,135,737, Cl. 280-747.000.

Damene, Guy, to Societe Lignes Telegraphiques et Telephoniques. Manufacture of gold barrier Schottky diodes. 4,136,348, Cl. 357-15.000.

Daniels, George R. E., to Dennison Manufacturing Co. Ink jet printing composition comprising a solvent, a dye stuff, a volatile base, a multi-valent metal and a polymer containing carboxyl groups. 4,136,076, Cl. 260-29.6HN.

Danilina, Anna E.: *See—*
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

d'Anjou, Marcel, to Mark Hot Inc. Ventilator system with adjustable damper fan. 4,135,850, Cl. 415-148.000.

Danneberg, Peter: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,136,185, Cl. 424-251.000.

Dany, Franz-Josef: *See—*
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Klose, Werner, 4,136,154, Cl. 423-265.000.

Darnall, John C., Jr., to Times Mirror Company, The. Method for molding a curved flexible printing plate. 4,136,150, Cl. 264-318.000.

Data Recording Instrument Co. Ltd.: *See—*
Chick, David M.; and Hawthorne, David B., 4,136,365, Cl. 360-78.000.

Davidson, Arthur; and Herrell, Dennis J., to International Business Machines Corporation. Josephson self gating And circuit and latch circuit. 4,136,290, Cl. 307-277.000.

Davies, Robert W.; and Wager, Leonard R., to Molins Limited. Article conveying mechanisms. 4,135,617, Cl. 198-458.000.

Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., to Bendix Autolite Corporation. Process for producing improved solid electrolyte oxygen gas sensors. 4,136,000, Cl. 204-195.00S.

Davis, Kirk E., to Lubrizol Corporation, The. Homogeneous compositions prepared from dimercaptothiadiazoles. 4,136,043, Cl. 252-47.500.

Davis, Lee W.; Hollingsworth, James S.; and Roberts, Leo L., to Little Giant Corporation. Impeller for a magnetically coupled pump. 4,135,863, Cl. 417-420.000.

Davis, Philip S.: *See—*
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,136,152, Cl. 423-242.000.

Day, George E.: *See—*
Johnson, R. W.; and Day, George E., 4,135,764, Cl. 301-6.0CS.

Day, Joseph G., to Johnson, Matthey & Co., Limited. Extraction of metals. 4,135,923, Cl. 75-153.000.

Day, William H., to National Research Development Corporation. Orthopaedic fracture fixing apparatus. 4,135,505, Cl. 128-92.00A.

Dayco Corporation: *See—*
Loyer, Philip K., 4,135,869, Cl. 425-71.000.

DBX, Inc.: *See—*
Blackmer, David E.; and Jaeger, C. Rene, 4,136,314, Cl. 328-167.000.

Dean, Lee W., III; and Peracchio, Aldo A., to United Technologies Corporation. Sound suppressor liners. 4,135,603, Cl. 181-286.000.

deBettencourt, Joseph T.: *See—*
Rowland, Howard J.; and deBettencourt, Joseph T., 4,135,579, Cl. 166-248.000.

De Boer, Clarence; Dolak, Lester A.; and Peterson, Durey H., to Upjohn Company, The. Antibiotic 354 and process for producing same. 4,136,171, Cl. 424-117.000.

Decker, John J.: *See—*
Burwell, Anson C., Jr.; and Decker, John J., 4,135,384, Cl. 73-40.700.

Deeg, Emil W.; and Travnicek, Edward A., to American Optical Corporation. All plastic spectacles. 4,135,792, Cl. 351-41.000.

Degawa, Takashi, to Hitachi, Ltd. Swash plate type compressor. 4,135,862, Cl. 417-269.000.

DeGraaf, Douglas W., to Chicago Bridge & Iron Company. Hose storage and supply apparatus. 4,135,543, Cl. 137-236.00S.

Degremont: *See—*
Louboutin, Robert; and Savall, Vincent, 4,136,012, Cl. 210-208.000.

De Haan, Douwe R.; and Kettenes, Dirk K., to P.F.W. Beheer B.V. 1-Crotonyl-2,2,6-trimethylcyclohexane. 4,136,066, Cl. 252-522.000.

Dehaas, Gerrit G., to Weyerhaeuser Company. Spent liquor treatment. 4,135,968, Cl. 162-30.00R.

Dehar, David C., to Ford Motor Company. Quick connect fluid fitting. 4,135,745, Cl. 285-319.000.

DeJovine, James M.: *See—*
DeVries, Donald L.; and DeJovine, James M., 4,136,040, Cl. 252-30.000.

del Pino, Fernando: *See—*
Steinstrasser, Rolf; and del Pino, Fernando, 4,136,053, Cl. 252-299.000.

DeMoss, Dean L.; and Ragle, Herbert U., to Burroughs Corporation. Improved through-partitioning of portable flexible disk pack and associated apparatus. 4,136,368, Cl. 360-98.000.

Dennison Manufacturing Co.: *See—*
Daniels, George R. E., 4,136,076, Cl. 260-29.6HN.
Joyce, Arthur W., 4,136,148, Cl. 264-291.000.

de Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Secondary batteries. 4,136,235, Cl. 429-204.000.

den Otter, Marinus J. A. M.; and te Nijenhuis, Anne, to Stamicarbon, B.V. Process for preparing a coated, thermosetting plastic foam having improved properties. 4,136,215, Cl. 427-204.000.

D'Entremont, John R.; and Abcouwer, Jan A. Miniature motor protector. 4,136,323, Cl. 337-107.000.

Derton, Harry E.; and Cope, Dewey M., to Centrifugal & Mechanical Industries, Inc. Horizontal centrifugal separator. 4,135,659, Cl. 233-3.000.

Desher, Elmer J.: *See—*
Benson, Philip A.; Haire, Thomas A.; Desher, Elmer J.; and Carpenter, Herbert L., Jr., 4,135,657, Cl. 229-5.700.

Detroit Tool & Engineering Co.: *See—*
Miner, Earl L., 4,135,270, Cl. 15-53.00A.

Deutsch, Ralph, to Deutsch Research Laboratories, Ltd. Electronic musical instrument ring modulator employing multiplication of signals. 4,135,427, Cl. 84-1.220.

Deutsch Research Laboratories, Ltd.: *See—*
Deutsch, Ralph, 4,135,427, Cl. 84-1.220.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Prochnow, Jurgen; and Trommsdorff, Wolf, 4,135,449, Cl. 102-52.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Lussling, Theodor; Theissen, Ferdinand; and Weigert, Wolfgang, 4,136,108, Cl. 260-465.80R.

DeVries, Donald L.; and DeJovine, James M., to Atlantic Richfield Company. Solid particles containing lubricating oil composition and method for using same. 4,136,040, Cl. 252-30.000.

Devuyst, Eric A. P.: *See—*
Ettel, Victor A.; Devuyst, Eric A. P.; Sridhar, Ramamritham; and O'Neill, Charles E., 4,135,918, Cl. 75-117.000.

Diamond Shamrock Technologies S.A.: *See—*
de Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido M., 4,136,235, Cl. 429-204.000.

Diaz, Stephen H., to Raychem Corporation. Cases for enclosing substrates. 4,135,587, Cl. 174-92.000.

Dieck, Ronald L.; Goldfarb, Louis; and Hann, Nancy D., to Armstrong Cork Company. Molecular-weight modification of polyphosphazenes. 4,136,084, Cl. 528-481.000.

Diehl, Robert E.; Levy, Stephen D.; and Gastrock, William H., to American Cyanamid Company. Preparation of 2,6-dinitroanilines. 4,136,117, Cl. 260-577.000.

Diesel Kiki Co., Ltd.: *See—*
Takada, Haruhiko, 4,135,865, Cl. 418-93.000.

Digequip Security Industries, Inc.: *See—*
Seifers, Monte G., 4,136,334, Cl. 340-529.000.

Di Giovanni, Mario, to ICT Instruments, Inc. Differential pressure measuring transducer assembly. 4,135,408, Cl. 73-721.000.
DiLeo, Philip F. Tennis racquet with insert. 4,135,717, Cl. 273-73.00L.
Dilg, Walter C.; and Martin, Albert E., to Dresser Industries, Inc. Coupler knuckle with safety shelf. 4,135,629, Cl. 213-153.000.
Dillon, Glenn W.; and Lindell, Albert H., to Stock Equipment Company. Closure construction. 4,135,639, Cl. 220-288.000.
Director of National Food Research Institute: *See*—
Noguchi, Akinori; Kimura, Susumu; and Umeda, Keiji, 4,136,210, Cl. 426-657.000.
DiRoma, Sabeto. Removable wheel and handle apparatus for trash receptacles. 4,135,725, Cl. 280-47.260.
Djeddah, Jacques L. Igniting electrodes and method for making same. 4,136,259, Cl. 174-152.00S.
Djie, Hien T.: *See*—
Blight, Graham J.; and Djie, Hien T., 4,135,842, Cl. 405-209.000.
Dlugos, Daniel F., to Pitney-Bowes, Inc. Operator prompting system. 4,135,662, Cl. 235-304.000.
Dmitrievich, Loschilin E.: *See*—
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.
Doan, Duc. Vidicon reader. 4,136,361, Cl. 358-94.000.
Doane, Patrick K.; and Springston, David R., to Kimball International, Inc. Envelope generator for electronic organ. 4,135,425, Cl. 84-1.130.
Dobkin, Robert C., to National Semiconductor Corporation. Power transistor including a sense emitter and a reference emitter for enabling power dissipation to be limited to less than a destructive level. 4,136,354, Cl. 357-36.000.
Dobrescu, Lucia; Huygelen, Constant; and Van Wijnendaele, Frans, to Recherche et Industrie, Therapeutiques, RIT. Vaccines against oedema disease of piglets. 4,136,181, Cl. 424-92.000.
Dr. E. Fresenius Chemisch pharmazeutische Industrie KG, Apparatebau KG: *See*—
Schindler, Johannes G.; and Riemann, Werner, 4,135,999, Cl. 204-195.00M.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Bott, Helmuth; and Nothacker, Siegfried, 4,135,759, Cl. 296-153.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Hoffrichter, Ingo; and Knop, Hans-Georg, 4,136,360, Cl. 358-80.000.
Doggett, Roger H.; and Buccigross, Henry L., to Lubrizol Corporation, The. Compositions comprising a plasticizer and an N-sulfohydrocarbon-substituted acrylamide polymer. 4,136,078, Cl. 260-33.20R.
Doherty, Norman R.; and Doherty, Richard F. Die set leader pin. 4,135,770, Cl. 308-4.00C.
Doherty, Richard F.: *See*—
Doherty, Norman R.; and Doherty, Richard F., 4,135,770, Cl. 308-4.00C.
Dolak, Lester A.: *See*—
De Boer, Clarence; Dolak, Lester A.; and Peterson, Durey H., 4,136,171, Cl. 424-117.000.
Dombroski, John R.; and Stoakley, Diane M., to Eastman Kodak Company. Cyanoacrylate dental adhesive compositions. 4,136,138, Cl. 260-881.000.
Domtar Inc.: *See*—
Karnis, Alkibiadis; and Wood, John R., 4,135,389, Cl. 73-61.400.
Donahue, Paul E.: *See*—
Williams, Frank J., III; and Donahue, Paul E., 4,136,087, Cl. 528-219.000.
Donaldson Company, Inc.: *See*—
Gauer, Daniel S., 4,135,899, Cl. 55-482.000.
Donnelly Mirrors, Inc.: *See*—
Stegenga, Philip D.; and Vandenbrink, Wayne, 4,135,694, Cl. 248-478.000.
Dorawala, Tansukhlal G.; and Reinhard, Russell R., to Texaco Inc. Steam dealkylation. 4,136,129, Cl. 260-672.00R.
Dornier GmbH: *See*—
Herpfer, Eugen, 4,135,686, Cl. 244-3.270.
Dow Chemical Company, The: *See*—
Ammann, Rudolf, 4,136,241, Cl. 521-163.000.
Grosshandler, Sandor, 4,136,034, Cl. 210-346.000.
Lewis, Jon; and Shea, Philip J., 4,136,182, Cl. 424-248.540.
Moll, Norman G.; and Quarderer, George J., 4,136,013, Cl. 208-10.000.
Staples, Thomas L., 4,136,048, Cl. 252-59.000.
Drabek, Jozef: *See*—
Boger, Manfred; Beriger, Ernst; Drabek, Jozef; Durr, Dieter; and Rufenacht, Kurt, 4,136,106, Cl. 260-456.00A.
Draft Systems, Inc.: *See*—
Fallon, Merton R.; and Clements, Thomas W., 4,135,641, Cl. 222-1.000.
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; and Langdon, Michael J., to Xerox Corporation. Multicolor xerographic process. 4,135,927, Cl. 96-1.200.
Dren, Anthony T.; and Bopp, Barbara A., to Abbott Laboratories. Benzopyranopyridines as antiglaucoma agents. 4,136,183, Cl. 424-248.560.
Dresser Industries, Inc.: *See*—
Dilg, Walter C.; and Martin, Albert E., 4,135,629, Cl. 213-153.000.
Hopkinson, Eric C., 4,136,279, Cl. 250-270.000.
Oliver, Donald W., 4,136,278, Cl. 250-269.000.
Drews, Udo W.; and Shifrin, Norman, to Perkin-Elmer Corporation, The. Beam combining apparatus. 4,135,820, Cl. 356-320.000.
Dreyfuss, Patricia; and Kennedy, Joseph P., to University of Akron, The. Graft copolymers of hydrocarbons and small ring heterocyclic compounds and process for the preparation thereof. 4,136,136, Cl. 260-878.00R.
Drillco Equipment Company, Inc.: *See*—
Schalge, Roger D.; and Neos, Gus, 4,135,432, Cl. 85-84.000.
Driscoll, Richard P., to Steelcase Inc. Movable divider panels with electrical wiring. 4,135,775, Cl. 339-22.00R.
Drobnik, Leszek R.; and Rebish, Edward J., to Acme-Cleveland Corporation. Molding machine clean out. 4,135,569, Cl. 164-158.000.
Drost Machines B.V.: *See*—
Bouwman, Aries, 4,135,580, Cl. 171-61.000.
Druss, Barry L., to Chimera Research & Development Inc. Adjustable boot-ski interface mechanisms. 4,135,736, Cl. 280-636.000.
Du Pont of Canada Limited: *See*—
Wolstencroft, Michael J., 4,135,356, Cl. 57-343.000.
Duchemin, Jean-Pascal: *See*—
Moutou, Paul C.; Gibeau, Pierre; and Duchemin, Jean-Pascal, 4,136,352, Cl. 357-22.000.
Dudley, Fred T.; and Spector, George. Tank for fuel tanker. 4,135,465, Cl. 114-74.00A.
Dudley, Michael A., to Canada Wire & Cable Limited. Process and bath composition for increasing the rate of polymer deposition in electrocoating. 4,136,074, Cl. 260-29.2EP.
Duffy, James J., to Ford Motor Co. Two-stage flow control valve for a power steering system. 4,135,436, Cl. 91-468.000.
Dugan, William P.; and Muhr, John A., to General Dynamics Corporation. One hundred percent pattern plating of plated through-hole circuit boards. 4,135,988, Cl. 204-15.000.
Dunlap, Howard L.: *See*—
Anderson, C. Lawrence; and Dunlap, Howard L., 4,135,952, Cl. 148-1.500.
Dunlop Limited: *See*—
Williams, Geoffrey A.; and Green, Keith R., 4,135,769, Cl. 303-106.000.
Du Pont de Nemours, E. I., and Company: *See*—
Balmat, Jean L., 4,135,911, Cl. 75-0.5AB.
Bice, Archie R.; and Burchett, Donald K., 4,136,251, Cl. 528-486.000.
Hazan, Isidor, 4,136,070, Cl. 260-23.0AR.
Hoeschele, Guenther K., 4,136,090, Cl. 260-45.95H.
Van Remoortel, John G., 4,135,773, Cl. 308-238.000.
Weigert, Frank J., 4,136,156, Cl. 423-372.000.
Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Electrochemical generators with auxiliary cathode. 4,136,232, Cl. 429-15.000.
Durr, Dieter: *See*—
Boger, Manfred; Beriger, Ernst; Drabek, Jozef; Durr, Dieter; and Rufenacht, Kurt, 4,136,106, Cl. 260-456.00A.
Durst, Heinz, to Tacole Etablissement. Artificial cross-country skiing practice set. 4,135,666, Cl. 238-10.00R.
Duryea, Josiah T., to Boeing Company, The. Sealant applicator. 4,135,476, Cl. 118-259.000.
Dussa, Ewald: *See*—
Harcuba, Siegfried; and Dussa, Ewald, 4,135,620, Cl. 198-836.000.
Dutcher, Robert G., to Medtronic, Inc. Body implantable lead and electrode. 4,135,518, Cl. 128-418.000.
Dyott, Richard B., to Andrew Corporation. Optical fiber tap. 4,135,780, Cl. 350-96.150.
E. F. Johnson Company: *See*—
Ailawadhi, Manohar L.; Ryan, James H.; and Wahi, Chander M., 4,135,776, Cl. 339-177.00R.
E. R. Squibb & Sons, Inc.: *See*—
Haugwitz, Rudiger D.; and Wade, Peter C., 4,136,174, Cl. 424-184.000.
E-Systems, Inc.: *See*—
Pruett, Barry B., 4,135,989, Cl. 204-129.100.
E-Z-EM Company, Inc.: *See*—
Meyers, Phillip H.; and Greene, Franklin R., 4,135,497, Cl. 128-2.00H.
Eang, Tan H.; McDonald, John O.; and Yi, Kenneth C., to Union Carbide Corporation. Apparatus for filling bulk material containers. 4,135,560, Cl. 141-198.000.
Eastman Kodak Company: *See*—
Columbus, Richard L., 4,136,036, Cl. 210-516.000.
Dombroski, John R.; and Stoakley, Diane M., 4,136,138, Cl. 260-881.000.
Fernandez, Jose M.; McCreary, Michael D.; Ross, Robert E.; and Staples, Jon T., 4,135,929, Cl. 96-29.00D.
Irick, Gether, Jr.; and Wang, Richard H. S., 4,136,083, Cl. 252-400.00A.
Vachon, Raymond N.; and McConnell, Richard L., 4,136,069, Cl. 260-23.0AR.
Eastman Technology, Inc.: *See*—
Moeller, Charles R., 4,136,370, Cl. 360-111.000.
Moeller, Charles R., 4,136,371, Cl. 360-111.000.
Eberle, Keith F. Snowmobile rollover protective structure. 4,135,591, Cl. 180-5.00R.
Ecodyne Corporation: *See*—
Bakken, Daniel A.; Henderson, Robert A.; and Tischler, Edward J., 4,136,032, Cl. 210-278.000.
Edgar, William D.: *See*—
Cain, George R.; Gidick, Ward F.; and Edgar, William D., 4,135,986, Cl. 202-227.000.
Edwards, Frank A. Fuel feed device. 4,135,483, Cl. 123-133.000.

Edwards, Stanley E.: *See*—
Baldwin, Richard D.; and Edwards, Stanley E., 4,135,649, Cl. 222-511.000.
Efimov, Vasily I.: *See*—
Molochnikov, Viktor V.; Efimov, Vasily I.; Veraxo, Anatoly S.; and Savitsky, Evgeny M., 4,136,313, Cl. 324-57.00R.
Egee, Walter W.; and Cramer, Clarence W., to Campbell Soup Company. Cookie dispensing apparatus. 4,135,345, Cl. 53-55.000.
Eggermont, Ludwig D. J., to U.S. Philips Corporation. Digital filter having coefficient number generator. 4,136,398, Cl. 364-724.000.
Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See*—
Muller, Anton; Konig, Hubert; and Magiera, Helmut, 4,135,564, Cl. 152-182.000.
Eisenberg, Arnold J., to Owens-Corning Fiberglas Corporation. Entanglement of a first strand with a second strand. 4,135,353, Cl. 57-22.000.
Eisenberg, Morris, to Electrochimica Corporation. Chalcogenide battery. 4,136,233, Cl. 429-112.000.
Eisenhaure, David B., to Charles Stark Draper Laboratory, Inc., The. Self-contained heat generating system. 4,135,361, Cl. 60-39.020.
Eklund, Erik: *See*—
Persson, Leif; Hansen, Bonde; and Eklund, Erik, 4,136,005, Cl. 204-266.000.
Ekono Oy: *See*—
Mattern, Konrad, 4,135,567, Cl. 159-165.000.
Electrochimica Corporation: *See*—
Eisenberg, Morris, 4,136,233, Cl. 429-112.000.
Electrolytic Zinc Company of Australia Limited: *See*—
Matthew, Ian G.; Pickering, Ralph W.; Suzuki, Takashi; and Uchida, Hisashi, 4,135,912, Cl. 75-10.00R.
Elhaus, Friedrich W.; and Hilge, Bernhard, to Prolizenz AG.; and Elhaus, Friedrich Wilhelm. Method and apparatus for heat treatment of material to be worked on, especially of aluminum alloys or magnesium alloys. 4,135,704, Cl. 266-261.000.
Elhaus, Friedrich Wilhelm: *See*—
Elhaus, Friedrich W.; and Hilge, Bernhard, 4,135,704, Cl. 266-261.000.
Elion, Gertrude B.: *See*—
Rideout, Janet E.; Miller, Richard L.; and Elion, Gertrude B., 4,136,175, Cl. 424-180.000.
Eljutin, Alexandr V.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Elscint Ltd.: *See*—
Blumental, Raphael, 4,136,284, Cl. 250-445.00T.
Endo, Akira: *See*—
Asai, Tomiyasu; and Endo, Akira, 4,136,157, Cl. 423-395.000.
Endo, Shigeki: *See*—
Sakamoto, Yusuke; Kinugasa, Munetaka; Endo, Shigeki; Yamane, Mituo; and Fujie, Shigeyoshi, 4,136,027, Cl. 210-63.00Z.
England, Forrest E., to Westinghouse Electric Corp. Anti-tilting resilient support system for aimed airborne pod-enclosed sensor instruments. 4,135,688, Cl. 248-604.000.
Engwall, Bertil. Device to prevent vehicles from passing a temporarily speed-reduced part of a road with high speed. 4,135,839, Cl. 404-16.000.
Enomoto, Kouichi. Archery bow stabilizer. 4,135,486, Cl. 124-89.000.
Entat, Marcel. Method of producing propeller blades and improved propeller blades obtained by means of this method. 4,135,858, Cl. 416-223.00R.
Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H.: *See*—
Loire, Rene; and Guillaume, Daniel, 4,135,467, Cl. 114-219.000.
Entwistle Company, The: *See*—
Murphy, Thomas A.; Long, Richard E.; and Tebo, Kenneth L., 4,135,679, Cl. 242-128.000.
Epple, Gerhard, to BASF Aktiengesellschaft. Anthraquinoid dyes. 4,136,100, Cl. 260-377.000.
Erickson, John W.: *See*—
Brown, Francis B.; Erickson, John W.; and Petrie, Harold L., 4,135,861, Cl. 417-183.000.
Ernst Leitz GmbH: *See*—
Schmid-Schonbein, Holger, 4,135,819, Cl. 356-39.000.
Ernst Leitz Wetzlar GmbH: *See*—
Pfeil, Emanuel; and Broemer, Heinz, 4,135,935, Cl. 106-35.000.
Escher, Balint: *See*—
Moulin, Michele; Escher, Balint; Prince, Dominique; and Vasseux, Jean, 4,135,990, Cl. 204-32.00R.
Escher Wyss GmbH: *See*—
Kohrs, Manfred, 4,135,671, Cl. 241-46.040.
Essilor International Cie Generale d'Optique: *See*—
Billault, Pierre, 4,135,890, Cl. 51-124.00L.
Etablissements Francois Salomon et fils: *See*—
Salomon, Georges P. J., 4,135,734, Cl. 280-618.000.
Estaque, Andre F., to Societe Anonyme Automobiles Citroen. Device for monitoring the flow and temperature of a coolant. 4,136,330, Cl. 340-52.00F.
Esten, Harold. Sonic fishing lure. 4,135,323, Cl. 43-42.160.
Eterno, John S.; and Casler, Richard J., Jr., to Charles Stark Draper Laboratory, Inc., The. Adaptive cargo landing system. 4,136,391, Cl. 364-478.000.
Ethicon, Inc.: *See*—
Thyen, Eberhard H., 4,135,623, Cl. 206-63.300.
Ethyl Corporation: *See*—
Johnston, James D.; Starrett, Richmond M.; and Sanders, Robert N., 4,136,113, Cl. 260-544.00Y.
Marsee, Frederick J., 4,135,480, Cl. 123-117.00A.
Ettel, Victor A.; Devuyst, Eric A. P.; Sridhar, Ramamritham; and O'Neill, Charles E., to International Nickel Company, Inc., The. Roast-reductive leach process for copper recovery. 4,135,918, Cl. 75-117.000.
Eujita, Haruo; Ishikawa, Yasushi; Tachikawa, Hiroshi; and Nakamura, Taizo, to Nippon Steel Corporation. Method and apparatus for TIG welding. 4,136,273, Cl. 219-121.00P.
Eutectic Corporation: *See*—
Patel, Mahesh S., 4,136,230, Cl. 428-564.000.
Evans, Arthur A.; and Rifkin, Morton S., to Charles Bar-Lok Corp. Patio door security bar with lock. 4,135,376, Cl. 70-100.000.
Evans, John C., Jr., to United States of America, National Aeronautics and Space Administration. Method for fabricating solar cells having integrated collector grids. 4,135,290, Cl. 29-572.000.
Evans, Joseph H.; and Wolfe, Richard B., to Raychem Corporation. Recoverable sleeve. 4,135,553, Cl. 138-141.000.
Evans, Richard J.: *See*—
Greiner, William A., Jr.; and Evans, Richard J., 4,135,675, Cl. 242-67.10R.
Ex-Cell-O Corporation: *See*—
Murrah, Howard E., 4,135,439, Cl. 93-36.800.
Exxon Research & Engineering Co.: *See*—
Fung, Shun C.; and Tauster, Samuel J., 4,136,213, Cl. 427-122.000.
Lenack, Alain L. P., 4,136,041, Cl. 252-46.600.
Oswald, Alexis A., 4,136,103, Cl. 260-448.00C.
Ricci, Ronald L., 4,136,382, Cl. 363-137.000.
Rosensweig, Ronald E., 4,136,016, Cl. 208-134.000.
Rossi, Albert, 4,135,887, Cl. 44-62.000.
Ezekiel, Frederick D., to Foxboro Company, The. Method and apparatus for overrange protection of the transducer in a differential pressure transmitter. 4,135,407, Cl. 73-717.000.
Ezekiel, Shaoul, to Massachusetts Institute of Technology. Laser gyroscope. 4,135,822, Cl. 356-350.000.
F.B.J. Engineering Services Pty, Ltd.: *See*—
Urquhart, William J., 4,135,723, Cl. 277-203.000.
F.I.A.M.M. S.p.A. - Fabbrica Italiana Accumulatori Motocarri Montecchio: *See*—
Frigo, Domenico, 4,135,473, Cl. 116-142.00R.
Fahey, Thomas M.: *See*—
Rew, James A.; Simon, Albert B.; and Fahey, Thomas M., 4,135,298, Cl. 29-727.000.
Fair, Delbert W., to Continental Oil Company. Base plate and earth coupling assembly for shear-wave transducers. 4,135,599, Cl. 181-121.000.
Falkowski, Frank J.; and Wilson, Leonard T., to Ortho Diagnostics, Inc. Stabilized erythrocytes and methods therefor. 4,136,161, Cl. 424-3.000.
Fallon, Merton R.; and Clements, Thomas W., to Draft Systems, Inc. Apparatus and methods for dispensing fluid under pressure. 4,135,641, Cl. 222-1.000.
Faltin, Hans G. High speed insert handling mechanism and method. 4,135,708, Cl. 270-57.000.
Farrant, David J. Plough. 4,135,582, Cl. 172-280.000.
Farrell, John H.; Lawrie, Eugene G.; and Sagi, Zeev, to Houdaille Industries, Inc. Grinding control system for forming non-circular punching tools. 4,136,390, Cl. 364-474.000.
Favre, Eric, to Societe d'Assistance Technique pour Produits Nestle S.A. Capsule for beverage preparation. 4,136,202, Cl. 426-77.000.
Federighi, George B.: *See*—
Federighi, George J.; and Federighi, George B., 4,135,531, Cl. 134-95.000.
Federighi, George J.; and Federighi, George B. Dishwasher operated solely by steam and hot water pressure. 4,135,531, Cl. 134-95.000.
Fedro, John J.: *See*—
Sinclair, Robert I.; Godfrey, Frederick D., Jr.; and Fedro, John J., 4,135,962, Cl. 156-387.000.
Feit, Eugene D.; and Wurtz, Marguerite E., to Bell Telephone Laboratories, Incorporated. Cover coatings for printed circuits. 4,136,225, Cl. 428-201.000.
Feldman, Charles F., to Hill Brothers Chemical Company, Inc. Process for the production of pyruvic acid. 4,136,111, Cl. 562-577.000.
Feldman, Louis I, to GB Fermentation Industries, Inc. Microbial rennin. 4,136,201, Cl. 426-36.000.
Feldstein, Nathan, to Surface Technology, Inc. Non-precious metal colloidal dispersions for electroless metal deposition. 4,136,216, Cl. 427-306.000.
Fellows Corporation: *See*—
Tlaker, Erich; and Nichols, Clarence M., 4,136,302, Cl. 318-39.000.
Felsen, Karl H. Manual or automatic drainage device for downspouts. 4,135,540, Cl. 137-78.000.
Fenton, Richard J.: *See*—
Wright, Robert J.; Hecht, Ralph J.; and Fenton, Richard J., 4,135,286, Cl. 29-420.000.
Ferguson, John A.: *See*—
Rosenberg, Ira E.; Ferguson, John A.; and Loveless, Norman P., 4,135,524, Cl. 132-7.000.
Ferguson, Richard R. Stringed musical instrument pick dispenser. 4,135,431, Cl. 84-329.000.

Ferguson, William J. Hanger device. 4,135,692, Cl. 248-317.000.
Fernandez, Jose M.; McCreary, Michael D.; Ross, Robert E.; and Staples, Jon T., to Eastman Kodak Company. Photographic sulfonamido compounds and elements and processes using them. 4,135,929, Cl. 96-29.00D.
Feuerer, Ludwig: *See*—
Huber, Wolfgang; and Feuerer, Ludwig, 4,135,771, Cl. 308-9.000.
FIAT Societa per Azioni: *See*—
La Rocca, Aldo, 4,135,985, Cl. 202-176.000.
Field Form, Inc.: *See*—
Cotter, Donald P., 4,135,342, Cl. 52-461.000.
Fikentscher, Rolf; Glaser, Klaus; Gotsmann, Guenther; and Streit, Werner, to BASF Aktiengesellschaft. Zinc electroplating bath. 4,135,992, Cl. 204-55.00R.
Filderman, Rene G., to Societe Anonyme Francaise du Ferdo. Inertial locking device. 4,135,410, Cl. 74-411.500.
Filippini, Umberto; and Bianchini, Pierluigi, to Nuovo Pignone S.p.A. Control device for a valve actuator. 4,135,661, Cl. 235-132.00R.
Filterwerk Mann & Hummel GmbH: *See*—
Mieschke, Rudolf; and Mucke, Walter, 4,135,643, Cl. 222-47.000.
Fimml, Hans. Piston machine having a non-contacting seal. 4,135,437, Cl. 92-168.000.
Finkelshtein, Leonid I.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Finn, William M.; Peck, Michael C.; and Winstead, Maynard R., to A. E. Staley Manufacturing Company. Acrylic copolymer coatings. 4,136,075, Cl. 260-29.6TA.
Fischer, Arthur H., to Minerec Corporation. Flotation reagent and process. 4,136,020, Cl. 209-166.000.
Fischer, Karl; and Schwarze, Manfred. Expansion box temperature regulator for electric appliances. 4,136,324, Cl. 337-139.000.
Fisher, Howard M.: *See*—
Nagati, Rashed N.; Fisher, Howard M.; and Mrozek, John W., 4,135,703, Cl. 266-165.000.
Fismerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, to SPOFA, United Pharmaceutical Works. 2-Phenyl-2-carboxyethyl 1-(p-chlorobenzoyl)-5-methoxy-2-methyl-3-indolylacetate and process for preparation thereof. 4,136,194, Cl. 424-274.000.
Fisons Limited: *See*—
Beaumont, Thomas N.; Robinson, Norman; and Quinton, Geoffrey N., 4,136,151, Cl. 423-166.000.
FitzGerald, Joseph M.; and FitzGerald, Ruthann P. Illuminated aerodynamic enclosure for trucks and trailers. 4,135,754, Cl. 296-1.00S.
FitzGerald, Ruthann P.: *See*—
FitzGerald, Joseph M.; and FitzGerald, Ruthann P., 4,135,754, Cl. 296-1.00S.
Fitzsimons, Ron. Rocking toy. 4,135,712, Cl. 272-56.000.
Flanders, Thomas E.; and Moore, Herbert E., to General Electric Company. Well survey system modulation technique. 4,136,327, Cl. 340-18.0FM.
FMC Corporation: *See*—
Knight, Houston W.; and Gibbons, Harold M., 4,135,551, Cl. 137-614.060.
Manring, William H., 4,135,905, Cl. 65-136.000.
Fogarassy, Andre, to Societe Generale de Brevets Industriels et Ohimiques. Process for producing cellulose pulp by solid phase digestion. 4,135,967, Cl. 162-29.000.
Fohl, Timothy, to GTE Sylvania Incorporated. Foldable photoflash lamp unit. 4,136,377, Cl. 362-13.000.
Fontanges, Robert, to Science Union et Cie, Societe Francaise de Recherche Medicale. Process for the preparation of neuraminidase from viral sources and methods of utilizing same. 4,136,168, Cl. 424-89.000.
Ford Motor Company: *See*—
Cambern, Bruce P., 4,136,328, Cl. 340-52.00E.
Dehar, David C., 4,135,745, Cl. 285-319.000.
Duffy, James J., 4,135,436, Cl. 91-468.000.
Fortuin, Michael S.: *See*—
Appleyard, George D.; Caunt, Anthony D.; Fortuin, Michael S.; and Heggs, Thomas G., 4,136,243, Cl. 526-139.000.
Forward, John E.; Muller, George A.; and Connolly, Douglas P., to Xerox Corporation. Wiper arrangement for toner level sensor. 4,135,642, Cl. 222-23.000.
Foseco International Limited: *See*—
Hammerton, Roderic H., 4,135,589, Cl. 277-1.000.
Foster, Basil B.; and Hirst, Ian J., to International Standard Electric Corporation. Transmission systems. 4,136,267, Cl. 179-170.00A.
Foster, George W., to Chloride Group Limited. Automatic electric battery charging apparatus. 4,136,310, Cl. 320-37.000.
Foster, Stephen R.: *See*—
Akkerman, Neil H.; and Foster, Stephen R., 4,135,547, Cl. 137-315.000.
Fournex, Robert: *See*—
Nedelec, Lucien; Torelli, Vesperto; and Fournex, Robert, 4,136,179, Cl. 424-242.000.
Fouts, Robert E., to Fouts, Robert Earl. Terminal fitting for a tubular conduit. 4,135,744, Cl. 285-253.000.
Fouts, Robert Earl: *See*—
Fouts, Robert E., 4,135,744, Cl. 285-253.000.
Fowkes, Ronald, to Lucas Industries Limited. Electrically driven vehicles. 4,135,593, Cl. 180-65.00R.
Fowler, James M.; and Moran, George A., to ACF Industries, Incorporated. Ball valve seat assembly having a swaged seat ring to retain the face seal. 4,135,545, Cl. 137-246.220.
Fowler, Joe R.: *See*—
Pogonowski, Ivo C.; and Fowler, Joe R., 4,136,008, Cl. 210-83.000.
Fox, Gerhard, to Pektin-Fabrik Hermann Herbstreith KG. Process for the production of a pectin preparation and for the production of a food-grade gelling agent and the gelling agent prepared therefrom. 4,136,209, Cl. 426-577.000.
Fox, Richard Q., to Westinghouse Electric Corp. Method of power demand control with time dependent target. 4,136,393, Cl. 364-492.000.
Foxboro Company, The: *See*—
Ezekiel, Frederick D., 4,135,407, Cl. 73-717.000.
Frank, John W.; and Lucking, Lawrence M., to Minnesota Mining & Manufacturing Company. Camera with flash exposing device. 4,135,813, Cl. 355-71.000.
Frankl & Kirchner GmbH & Co., KG: *See*—
Lengsfeld, Karl, 4,135,612, Cl. 192-18.00B.
Franks, Neal E., to Akzona Incorporated. Process for making solutions of cellulosic compounds. 4,136,255, Cl. 536-60.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,135,332, Cl. 51-5.00D.
Theurer, Josef; and Ollerer, Friedrich, 4,135,631, Cl. 214-38.0CA.
Frederiksen, Thomas M., to National Semiconductor Corporation. Integrated circuit package with optical input coupler. 4,136,357, Cl. 357-72.000.
Freeman, Catherine. Liquid applicator. 4,135,274, Cl. 15-244.00R.
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Frye, Lance C. Container or like structure. 4,135,634, Cl. 220-5.00A.
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Fuhring, Heinrich; and Steitz, Winfried, to Bowe Bohler & Weber KG. Apparatus for the treatment of webs of material. 4,135,310, Cl. 34-52.000.
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Asai, Tomiyasu; and Endo, Akira, 4,136,157, Cl. 423-395.000.
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Kitajima, Masao, 4,135,976, Cl. 195-2.000.
Ohmura, Hiroshi; and Shirane, Hideto, 4,135,797, Cl. 354-128.000.
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Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,135,491, Cl. 126-270.000.
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Fukuda, Tsuguo, to Tokyo Shibaura Electric Co., Ltd. Lithium tantalate single crystal growth from a platinum-rhodium crucible in an inert gas, nitrogen or reducing gas atmosphere. 4,135,963, Cl. 156-617.0SP.
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G. D. Societa per Azioni: *See*—
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Chang, Augustine W.; and Gaind, Arun K., 4,135,954, Cl. 148-187.000.
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Gall, Herbert J.; and Noonan, Robert T., to National Railroad Passenger Corporation. Vehicle cleaning system. 4,135,533, Cl. 134-104.000.
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Gannon, Patrick M.; Heller, Andrew R.; and Smith, Ronald M., to International Business Machines Corporation. Synonym control means for multiple virtual storage systems. 4,136,385, Cl. 364-200.000.
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Gates Rubber Company, The: *See*—
Payne, Roger A., 4,136,149, Cl. 264-300.000.
Gates, William H.: *See*—
Reich, Sanford; and Gates, William H., 4,135,253, Cl. 3-1.700.
Gauer, Daniel S., to Donaldson Company, Inc. Safety filter for air cleaner. 4,135,899, Cl. 55-482.000.
Gaulder, Clifford F. Noise suppressor system. 4,135,590, Cl. 179-1.00P.
Gault, Terrell W.; and Maguire, Edward J., Jr., to Procter & Gamble Company, The. Detergent compositions containing ethoxylated nonionic surfactants and silicone containing suds suppressing agents. 4,136,045, Cl. 252-135.000.
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GB Fermentation Industries, Inc.: *See*—
Feldman, Louis I., 4,136,201, Cl. 426-36.000.
GEC Mechanical Handling Limited: *See*—
Kennard, John M., 4,135,915, Cl. 75-60.000.
Gederos, Wayne L. Razor clam shovel. 4,135,751, Cl. 294-49.000.
Geimuplast Peter Mundt KG: *See*—
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Gem Products, Inc.: *See*—
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Chevali, Harihar D., 4,136,378, Cl. 362-13.000.
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Crivello, James V., 4,136,102, Cl. 260-440.000.
Flanders, Thomas E.; and Moore, Herbert E., 4,136,327, Cl. 340-18.0FM.
Green, David H.; Collins, Edward J.; and Sterling, Vaughn C., 4,136,376, Cl. 362-10.000.
Hansler, Richard L., 4,136,298, Cl. 313-217.000.
Hickey, John S., 4,136,296, Cl. 310-269.000.
Kewley, Norman E., 4,136,375, Cl. 362-10.000.
Smith, William E., 4,136,099, Cl. 260-346.110.
Waldron, Wesley K., 4,136,291, Cl. 307-308.000.
Williams, Frank J., III; and Donahue, Paul E., 4,136,087, Cl. 528-219.000.
General Motors Corporation: *See*—
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Templin, Jackson R., 4,135,390, Cl. 73-136.00C.
General Signal Corporation: *See*—
Larime, Carl M., 4,136,337, Cl. 340-384.00R.
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Georgi, Bernd: *See*—
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Gerrard, James A., to Xerox Corporation. Exposure control system for a document copying machine. 4,136,277, Cl. 250-205.000.
Gersch, Karl H., to Balcke-Durr Aktiengeseilschaft. Tube wall made of tubes which extend parallel to one another and horizontal to inclined. 4,135,575, Cl. 165-171.000.
Gershaw, Nathan: *See*—
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Gilman, Richard: *See*—
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Gilman, Richard L. Impact-absorbing laminate and method of manufacture thereof. 4,136,226, Cl. 428-315.000.
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Ginsburg, Sam. Portable means for supporting a net. 4,135,716, Cl. 273-29.0BC.
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., to Vsesojuzny Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Po Truboprovodnym Konteinernym Sisteman. Device for braking containers of pneumatic tube transport installations. 4,135,685, Cl. 243-38.000.
Gladieux, Norman K.; Herrington, Richard A.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Sheet heat treating furnace. 4,135,906, Cl. 65-348.000.
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Glenn, Robert G., to Westinghouse Electric Corp. Variable vane and flowpath support assembly for a gas turbine. 4,135,362, Cl. 60-39.16R.
Glick, Arthur, to American Cyanamid Company. Packaged, desiccated surgical elements. 4,135,622, Cl. 206-63.300.
Gloersen, Stig. Method and device for equalizing the moisture content of porous material. 4,135,966, Cl. 162-17.000.
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Onoe, Katuhiko; and Tanaka, Takashi, 4,135,529, Cl. 133-3.00C.
Gniewek, John J.; Reith, Timothy M.; Sullivan, Michael J.; and White, James F., to International Business Machines Corp. Method for forming Pt-Si Schottky barrier contact. 4,135,998, Cl. 204-192.00E.
Gobush, William: *See*—
Sullivan, Paul F.; Lynch, Francis deS.; Gobush, William; and Hottel, Hoyt C., Jr., 4,136,387, Cl. 364-410.000.
Goddard, Terrence P.; and Thatcher, Donald N., to Teledyne McCormick Selph. Coprecipitated pyrotechnic composition processes and resultant products. 4,135,956, Cl. 149-22.000.
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Godsey, David W. Medication dispensing cup. 4,135,512, Cl. 128-222.000.
Golden, Martin P., to United States of America, Energy. Core disruptive accident margin seal. 4,135,973, Cl. 176-87.000.

Goldfarb, Louis: *See*—
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Goldman, Melvin: *See*—
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Gondek, John T. Air cleaner. 4,135,897, Cl. 55-404.000.

Goodyear Tire & Rubber Company, The: *See*—
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Gora, Jozef: *See*—
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Goral, Adam H. Bicycle lock. 4,135,374, Cl. 70-18.000.

Gorran, Jody A., to Medpro, Inc. Apparatus for oscillating flotation support systems. 4,135,500, Cl. 128-33.000.

Gotoh, Miyuki; and Ichimatsu, Eizi. Device for detecting the loss of tension of a warp yarn in a weaving loom. 4,135,554, Cl. 139-337.000.

Gotsmann, Guenther: *See*—
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Gould Inc.: *See*—
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Govignon, Jacques P., to Varian Associates, Inc. Reduced glare scanner. 4,135,791, Cl. 351-7.000.

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Martin, Harold B., 4,135,713, Cl. 272-74.000.

Greatbatch, Wilson. Cardiac pacer having alkali metal-halogen cell with mixed halogen cathode. 4,135,519, Cl. 128-419.0PS.

Green, David H.; Collins, Edward J.; and Sterling, Vaughn C., to General Electric Company. Photoflash lamp array circuit board having electrical insulation. 4,136,376, Cl. 362-10.000.

Green, Keith R.: *See*—
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Green, Norman W., to Occidental Petroleum Corporation. Method for preventing plugging in the pyrolysis of agglomerative coals. 4,135,982, Cl. 201-12.000.

Greene, Franklin R.: *See*—
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Greiner, William A., Jr.; and Evans, Richard J., to Armstrong Cork Company. Paper carrier stripping method and apparatus. 4,135,675, Cl. 242-67.10R.

Gresh, Peter P. Rinse sink skimmer. 4,135,260, Cl. 4-201.000.

Gresset, Bernard F., to Jouets Educatifs Universels. Toy such as a board. 4,135,303, Cl. 33-18.00R.

Griffith, Glen R.: *See*—
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Grilli, Victor J.: *See*—
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Grimova, Jaroslava: *See*—
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Gross, Glenn M., to Norlin Music, Inc. Automatic rhythm generator. 4,135,423, Cl. 84-1.030.

Grossbach, Alfred. Sliding door assembly for motor vehicles. 4,135,760, Cl. 296-155.000.

Grosshandler, Sandor, to Dow Chemical Company, The. Low pressure high volume filter apparatus. 4,136,034, Cl. 210-346.000.

Grove Valve and Regulator Company: *See*—
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GTE Sylvania Incorporated: *See*—
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Guillaume, Daniel: *See*—
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Spanke, Edwin A., 4,135,611, Cl. 192-18.00A.

Gulibon, Robert S.: *See*—
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Gunter & Cooke, Inc.: *See*—
Gunter, Josef K.; Jones, Thomas R.; and Dabbs, Phillip E., 4,135,275, Cl. 19-107.000.

Gunter, Josef K.; Jones, Thomas R.; and Dabbs, Phillip E., to Gunter & Cooke, Inc. High speed card. 4,135,275, Cl. 19-107.000.

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Guttenberger, Peter; and Schroeder, Harry, to Siemens Aktiengesellschaft. Method for the production of a coil body with connecting pins incorporated in the course of injection. 4,135,297, Cl. 29-629.000.

Haag, Werner O.; and Olson, David H., to Mobil Oil Corporation. Catalytic alkylation/transalkylation. 4,136,128, Cl. 260-671.00R.

Haeckel, Rainer; Oellerich, Michael; Heerdt, Ruth; Hubner, Manfred; and Kuhnle, Hans, to Boehringer Mannheim GmbH. Hypoglycaemically active 2-(phenylalkyl- or -alkenyl hydrazono)-propionic acid derivatives. 4,136,196, Cl. 424-319.000.

Hagberg, Bruce E. Serving device. 4,135,658, Cl. 232-43.100.

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Hall, Gunnar B. Arrangement for dampening sound-vibrations in elongate hollow members such as masts of sailing vessels and methods for dampening sound-vibrations. 4,135,466, Cl. 114-90.000.

Hall, James K., to Beckman Instruments, Inc. Seal for liquid crystal display. 4,135,789, Cl. 350-343.000.

Hall, John B.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,208, Cl. 426-538.000.

Hammann, Ingeborg: *See*—
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Hammerton, Roderic H., to Foseco International Limited. Ingot mould seal. 4,135,589, Cl. 277-1.000.

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Handschuch, Karl; and Konig, Reinhard, to Schubert & Salzer. Apparatus for removing impurities from fibrous material. 4,135,276, Cl. 19-204.000.

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Hann, Nancy D.: *See*—
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Hannon, Charles N. Closure testing means and method. 4,135,306, Cl. 33-199.00B.

Hannula, Rodney R., to Minnesota Mining and Manufacturing Company. Center venting closure system. 4,135,637, Cl. 220-271.000.

Hansen, Bonde: *See*—
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Hansler, Richard L., to General Electric Company. Electrode-inlead for miniature discharge lamps. 4,136,298, Cl. 313-217.000.

Hanson, Robert B., to Standard Oil Company (Indiana). Process for controlling the melt flow of amide-imide polymers. 4,136,085, Cl. 528-189.000.

Hanson, William D.: *See*—
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Okuda, Yosiro; Horiishi, Nanao; Sumita, Hiroshi; and Harada, Tosiharu, 4,136,158, Cl. 423-632.000.

Harcuba, Siegfried; and Dussa, Ewald, to Compriforce AG. Adjustable conveying device. 4,135,620, Cl. 198-836.000.

Harder, Sven, to A/S Hotaco. Plate-shaped roofing element. 4,136,223, Cl. 428-139.000.

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Hardwicke, Robert L., to Arrowcraft Products, Inc. Wheel adapter. 4,135,765, Cl. 301-36.00R.

Hargreaves, Brian; and Richmond, Michael H., to Polysar Limited. Process for extruding stabilized expanded polystyrene composition. 4,136,142, Cl. 264-53.000.

Harkness, Jack W.; and Mefford, Maurice P., to Harkness, Jack W. Foam injection nozzle. 4,135,882, Cl. 422-133.000.
Harris, Colin G.: *See—*
Winkler, Robert J.; Harris, Colin G.; and Sprague, Terry A., 4,135,668, Cl. 239-276.000.
Harris Corporation: *See—*
Gasner, John T.; and Rivoli, Anthony L., 4,135,955, Cl. 148-187.000.
Harris, James J.; and Hammond, Richard E., to Arco Polymers, Inc. High efficiency catalysts for olefin polymerization. 4,136,058, Cl. 252-429.00B.
Harris, Leslie J. Condylocephalic nail for fixation of pertrochanteric fractures. 4,135,507, Cl. 128-92.0BC.
Harris, Rudy M.; Wolfe, Roger L.; and Martin, William T., to Marathon LeTourneau Company. Hoisting apparatus with improved anti-sway system. 4,135,628, Cl. 212-14.000.
Hartman, William R., Jr.: *See—*
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; and Langdon, Michael J., 4,135,927, Cl. 96-1.200.
Hasagawa, Gary K.: *See—*
Mascia, Carmen T.; and Hasagawa, Gary K., 4,135,647, Cl. 222-211.000.
Hasegawa, Kouji: *See—*
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; Sasaki, Kanemichi; and Hasegawa, Kouji, 4,136,191, Cl. 424-279.000.
Hasenclever, Kaspar D., to Chemische Fabrik Kreussler & Co., GmbH. Processes for the treatment of textiles and finishing agents for use therein. 4,135,879, Cl. 8-142.000.
Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, to Ricoh Co., Ltd. Electrophotographic light-sensitive member. 4,135,928, Cl. 96-1.50R.
Hashimoto, Tom T.: *See—*
Cox, David F.; and Hashimoto, Tom T., 4,135,340, Cl. 52-115.000.
Hashizume, Shin: *See—*
Ogiro, Kenji; Hashizume, Shin; Miyakawa, Seii; and Kishi, Masaya, 4,136,366, Cl. 360-96.000.
Haslam, Fred: *See—*
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Hatanaka, Kyohei: *See—*
Suzuki, Takeshi; Murao, Mikio; Utiyama, Susumu; Hatanaka, Kyohei; and Inoue, Hajime, 4,135,904, Cl. 65-27.000.
Haug, Edward W.; and Beck, Charles E., to Barber-Colman Company. Method of making inserted blade hob. 4,135,414, Cl. 76-101.00A.
Haugwitz, Rudiger D.; and Wade, Peter C., to E. R. Squibb & Sons, Inc. Benzimidazolecarbamates and method. 4,136,174, Cl. 424-184.000.
Hausmann, Winfried, to Massey-Ferguson Services N.V. Roll-over protective structure for vehicles and method of construction therefor. 4,135,756, Cl. 296-28.00J.
Hawthorne, David B.: *See—*
Chick, David M.; and Hawthorne, David B., 4,136,365, Cl. 360-78.000.
Hayashi, Jun: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,135,933, Cl. 96-100.00R.
Hayashida, Hajime, to Nippon Gakki Seizo Kabushiki Kaisha. Piano hammer. 4,135,430, Cl. 84-254.000.
Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Multimetallic catalytic composite. 4,136,064, Cl. 252-466.00B.
Hays, Herbert G., to Amana Refrigeration, Inc. Heat exchange control system. 4,135,487, Cl. 126-110.00R.
Hazan, Isidor, to Du Pont de Nemours, E. I., and Company. Cathodic electrodeposition of paints. 4,136,070, Cl. 260-23.0AR.
Health Technology Laboratories, Inc.: *See—*
Muriot, Edward E., 4,135,515, Cl. 128-276.000.
Hecht, Ralph J.: *See—*
Wright, Robert J.; Hecht, Ralph J.; and Fenton, Richard J., 4,135,286, Cl. 29-420.000.
Heddleston, Kenneth L.: *See—*
Rebers, Paul A.; and Heddleston, Kenneth L., 4,136,169, Cl. 424-92.000.
Heerdt, Ruth: *See—*
Haeckel, Rainer; Oellerich, Michael; Heerdt, Ruth; Hubner, Manfred; and Kuhnle, Hans, 4,136,196, Cl. 424-319.000.
Hubner, Manfred; Heerdt, Ruth; Bosies, Elmar; Kuhnle, Hans; and Schmidt, Felix H., 4,136,197, Cl. 424-319.000.
Heffner, Roy W.; and Blanning, Robert B., to Martin Marietta Corporation. Multiple source tracking system. 4,136,343, Cl. 343-117.00R.
Heggs, Thomas G.: *See—*
Appleyard, George D.; Caunt, Anthony D.; Fortuin, Michael S.; and Heggs, Thomas G., 4,136,243, Cl. 526-139.000.
Hein, Wolfgang: *See—*
Cosack, Klaus; Hein, Wolfgang; and Neumann, Manfred, 4,136,029, Cl. 210-242.00R.
Heitland, Herbert; Grundmann, Edgard; and Kroll, Rudolf, to Volkswagenwerk Aktiengesellschaft. Manifold arrangement. 4,135,492, Cl. 126-271.000.
Helena Rubinstein, Inc.: *See—*
Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., 4,136,166, Cl. 424-62.000.
Heller, Andrew R.: *See—*
Gannon, Patrick M.; Heller, Andrew R.; and Smith, Ronald M., 4,136,385, Cl. 364-200.000.
Hemmings, David T., to Tulon, Inc. Composite drill for drilling circuit boards. 4,135,847, Cl. 408-226.000.
Hems, Roger: *See—*
Rowsell, David G.; and Hems, Roger, 4,136,164, Cl. 424-54.000.
Hench, Hans H. W.; and Muller, Leo K. M., to Automatik Apparate-Maschinenbau H. Hench GmbH. Apparatus for dehumidifying solids being transported by a flowing gas. 4,135,767, Cl. 302-31.000.
Henderson, Robert A.: *See—*
Bakken, Daniel A.; Henderson, Robert A.; and Tischler, Edward J., 4,136,032, Cl. 210-278.000.
Hendricks, David E. Ventilated smoking pipe. 4,135,522, Cl. 131-198.00R.
Hendrickson, I. Glen: *See—*
Hansen, Karl A.; and Hendrickson, I. Glen, 4,135,379, Cl. 72-56.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Moller, Hinrich; and Thimm, Hans-Joachim, 4,136,165, Cl. 424-60.000.
Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA): *See—*
Petzold, Manfred; Uphues, Gunter; and Waltenberger, Peter, 4,136,054, Cl. 252-301.210.
Saran, Herbert; Krings, Peter; Schwuger, Milan J.; and Smolka, Heinz, 4,136,051, Cl. 252-91.000.
Henley, Thomas D., to Amchem Products. Removing oil emulsion from articles prior to coating articles and recovering oil from the emulsion. 4,136,217, Cl. 427-327.000.
Henry's Machine Works: *See—*
Trautloff, Gary, 4,135,766, Cl. 301-114.000.
Herpfer, Eugen, to Dornier GmbH. Device for starting rocket-driven missiles. 4,135,686, Cl. 244-3.270.
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Herrington, Richard A.: *See—*
Gladieux, Norman K.; Herrington, Richard A.; and Oelke, Waldemar W., 4,135,906, Cl. 65-348.000.
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Hession, Rodney J.: *See—*
Hession, Brent M.; and Hession, Rodney J., 4,135,651, Cl. 222-611.000.
Hesston Corporation: *See—*
Swenson, Edward L.; and Ankenman, Thomas W., 4,135,352, Cl. 56-341.000.
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,135,444, Cl. 100-50.000.
Hestair Stanhay Limited: *See—*
Willis, Robert A., 4,135,457, Cl. 111-52.000.
Hestermann, Klaus; and Heymer, Gero, to Hoechst Aktiengesellschaft. Production of phosphine. 4,136,155, Cl. 423-299.000.
Heyes, Peter J.: *See—*
Mayne, John E. O.; and Heyes, Peter J., 4,135,934, Cl. 106-14.360.
Heymer, Gero: *See—*
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Heyne, Klaus-Peter. Piano bass string. 4,135,429, Cl. 84-199.000.
Heyraud, Marc: *See—*
Aubert, Francois; and Heyraud, Marc, 4,136,294, Cl. 310-220.000.
Hickey, John S., to General Electric Company. High-speed, laminated rotor for homopolar inductor alternator. 4,136,296, Cl. 310-269.000.
Hickey, Thomas N.: *See—*
Parish, Harold C.; Spulgis, Ivars S.; Hickey, Thomas N.; and Hoy, David R., 4,135,896, Cl. 55-270.000.
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Hill Brothers Chemical Company, Inc.: *See—*
Feldman, Charles F., 4,136,111, Cl. 562-577.000.
Hill, Earl S., Jr.: *See—*
Ladish, Charles E.; and Hill, Earl S., Jr., 4,136,072, Cl. 260-27.00R.
Hilmann, Jurgen: *See—*
Fuchs, Peter; and Hilmann, Jurgen, 4,136,145, Cl. 264-164.000.
Fuchs, Peter; and Hilmann, Jurgen, 4,136,162, Cl. 424-27.000.
Hilterhaus, Karl H.; Reuter, Franz G.; and Menzel, Tankred, to Metallgesellschaft A.G.; Reuter Technologie GmbH; and Chemie-Anlagenbau Bischofsheim GmbH. Non-flammable and optionally electrically conductive organo-silicate polymers and process for preparing same. 4,136,238, Cl. 521-107.000.
Himes, Richard C.; and Craig, Bruce G., to Andersen 2000, Inc. Air filtration apparatus and method of operation thereof. 4,135,894, Cl. 55-91.000.
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,135,933, Cl. 96-100.00R.
Hirschy, Linda M.; Kane, Bernard J.; and Traynor, Sean G., to SCM Corporation. Preparation of β-phellandrene. 4,136,126, Cl. 260-666.00A.
Hirshman, Justin L.; and Treadwell, Kenneth, to M&T Chemicals Inc. Storage-stable precursors for rigid polyurethane foams. 4,136,046, Cl. 252-182.000.
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Degawa, Takashi, 4,135,862, Cl. 417-269.000.
Furihata, Makoto; Minamihata, Shigeaki; and Yokoyama, Takao, 4,136,289, Cl. 307-262.000.

Hosoda, Taisei; Uzuhashi, Hideo; Kobayashi, Nobuyuki; and Tanaka, Masaaki, 4,135,370, Cl. 62-274.000.
Ichikawa, Hisashi; and Ogiro, Kenji, 4,135,413, Cl. 74-529.000.
Kadota, Shozo; and Fujimoto, Yoshiji, 4,136,332, Cl. 340-146.30H.
Kusano, Masaaki, 4,136,356, Cl. 357-70.000.
Maezima, Masaaki, 4,136,322, Cl. 336-60.000.
Ogiro, Kenji; Hashizume, Shin; Miyakawa, Seii; and Kishi, Masaya, 4,136,366, Cl. 360-96.000.
Okada, Masakazu; Ide, Jushi; Yasumoto, Seiichi; and Fushimi, Hitoshi, 4,136,384, Cl. 364-200.000.
Okumura, Yoshio; Matsumoto, Genichi; Tachibana, Kyozo; and Nozaki, Yoshio, 4,136,305, Cl. 318-376.000.
Sugawara, Yoshitaka; Kamei, Tatsuya; Murakami, Susumu; Miyoshi, Tadahiko; and Ogawa, Takuzo, 4,136,351, Cl. 357-19.000.
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Hestermann, Klaus; and Heymer, Gero, 4,136,155, Cl. 423-299.000.
Martini, Thomas; and Kluge, Friedhelm, 4,136,121, Cl. 260-593.00H.
Moraw, Roland, 4,135,807, Cl. 355-9.000.
Nischwitz, Ehrenfried; Holst, Arno; Smerz, Ottokar; Kostrzewa, Michael; and Lask, Helmut, 4,136,218, Cl. 427-339.000.
Schroter, Herbert; and Stein, Eckehard, 4,135,814, Cl. 355-106.000.
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Klose, Werner, 4,136,154, Cl. 423-265.000.
von der Eltz, Hans-Ulrich; and Glander, Siegfried, 4,135,268, Cl. 8-155.100.

Hoeppner, Klaus, to Andreas Stihl, Firma. Motorized chain saw. 4,135,301, Cl. 30-381.000.

Hoeschele, Guenther K., to Du Pont de Nemours, E. I., and Company. Stabilized copolyetherester compositions. 4,136,090, Cl. 260-45.95H.

Hoffmann-La Roche Inc.: *See*—
Kyburz, Emilio; and Spiegelberg, Hans, 4,136,116, Cl. 260-570.800.

Hoffrichter, Ingo; and Knop, Hans-Georg, to Dr. Ing. Rudolf Hell GmbH. Apparatus including a circuit arrangement for adjusting the color signal levels of a white dot. 4,136,360, Cl. 358-80.000.

Hogan, John P.; and Witt, Donald R., to Phillips Petroleum Company. Continuous, multiple zone fluidized bed for particle treater. 4,136,061, Cl. 252-458.000.

Hokama, Yosh: *See*—
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Holland, Gerald F., to Pfizer Inc. Hypolipidemic substituted styrenesulfonylureas. 4,136,180, Cl. 424-244.000.

Hollandsche Aanneming Maatschappij B.V.: *See*—
Volbeda, Johan H., 4,135,318, Cl. 37-67.000.

Hollandse Signaalappareten, B.V.: *See*—
Mulder, Willem; Bouman, Antonius F. M.; and Zwarts, Johan M. C., 4,136,341, Cl. 343-17.2PC.

Hollenstein, Othmar: *See*—
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Hollingsworth, James S.: *See*—
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Holm, Harold K. Vibrators. 4,135,826, Cl. 366-116.000.

Holmes, Stannard D. Hinge with interfitting locking means. 4,135,273, Cl. 16-169.000.

Holst, Arno: *See*—
Nischwitz, Ehrenfried; Holst, Arno; Smerz, Ottokar; Kostrzewa, Michael; and Lask, Helmut, 4,136,218, Cl. 427-339.000.

Holt, Ralph J. Tethered airplane assembly. 4,135,711, Cl. 272-31.00A.

Honeywell Inc.: *See*—
Braitberg, Michael F., 4,136,347, Cl. 346-151.000.
Kruse, Paul W., Jr., 4,136,318, Cl. 331-94.50N.
Kuntz, Leland E., 4,135,304, Cl. 33-174.00P.
Westphal, Bruce D.; and Berardi, Jim A., 4,136,392, Cl. 364-492.000.

Hooker Chemicals & Plastics Corp.: *See*—
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Pelletier, Dennis C., 4,136,125, Cl. 260-648.00R.

Hoover Universal, Inc.: *See*—
Kitchen, John P.; Gabhart, Terry L.; and Lanham, Joseph S., 4,135,835, Cl. 403-108.000.

Hope, Henry F.; and Hope, Stephen F. Film dryer. 4,135,312, Cl. 34-160.000.

Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 4,135,312, Cl. 34-160.000.

Hopkinson, Eric C., to Dresser Industries, Inc. Method and apparatus for pulsed neutron spectral analysis using spectral stripping. 4,136,279, Cl. 250-270.000.

Horiishi, Nanao; Takedoi, Atushi; Kondo, Hiroyuki; Sumita, Hiroshi; Mukaizaka, Akira; and Matsui, Goro, to Toda Kogyo Corp. Process for treating acicular magnetite containing Co to stabilize the magnetic properties thereof. 4,136,049, Cl. 252-62.560.

Horiishi, Nanao: *See*—
Okuda, Yosiro; Horiishi, Nanao; Sumita, Hiroshi; and Harada, Tosiharu, 4,136,158, Cl. 423-632.000.

Horikoshi, Koki; and Nakamura, Nobuyuki, to Rikagaku Kenkyusho. Process for production of cyclodextrin. 4,135,977, Cl. 195-7.000.

Horiuchi, Tatumi: *See*—
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Horiuchi, Yoshifumi: *See*—
Ikuta, Shigeru; Horiuchi, Yoshifumi; Misaki, Hideo; Matsuura, Kazuo; Imamura, Shigeyuki; and Muto, Naoki, 4,135,980, Cl. 195-62.000.

Hornung, Peter: *See*—
Benedek, Gyorgy; and Hornung, Peter, 4,135,667, Cl. 239-697.000.

Horton, George F. Depth gauge and position marking device. 4,135,398, Cl. 73-305.000.

Horvallius, Torgny W., to Aktiebolaget SAMEFA. Optical assembly for generating light beams accurately at right-angles to each other. 4,135,823, Cl. 356-148.000.

Hosmer/Dorrance Corporation: *See*—
Weber, T. Jerome; and Roberts, Roy D., 4,135,254, Cl. 3-26.000.

Hosoda, Taisei; Uzuhashi, Hideo; Kobayashi, Nobuyuki; and Tanaka, Masaaki, to Hitachi, Ltd. Humidity control apparatus. 4,135,370, Cl. 62-274.000.

Hosoe, Kazuya: *See*—
Masunaga, Makoto; Hosoe, Kazuya; Tsunekawa, Tokuichi; Tamura, Shuichi; and Yokota, Hideo, 4,135,815, Cl. 356-4.000.

Hosokoshi, Kakuichiro; Nakamura, Hiroto; Sato, Akira; and Maeda, Masakazu, to Matsushita Electronics Corporation. Method for manufacturing the phosphor screen of color-picture tube. 4,135,930, Cl. 96-36.100.

Hottel, Hoyt C., Jr.: *See*—
Sullivan, Paul F.; Lynch, Francis deS.; Gobush, William; and Hottel, Hoyt C., Jr., 4,136,387, Cl. 364-410.000.

Houdaille Industries, Inc.: *See*—
Farrell, John H.; Lawrie, Eugene G.; and Sagi, Zeev, 4,136,390, Cl. 364-474.000.

Houlihan, William J., to Sandoz, Inc. Hydroxyalkyl substituted-4,5-dihydropyridazin(2H)-3-ones and diazabicyclo-ene-ones. 4,136,184, Cl. 424-250.000.

Houser, John E.; and Kramer, Ralph J., to Aerotherm, Inc. Pulp tree bark treatment. 4,135,907, Cl. 71-9.000.

Hovermarine Transport Limited: *See*—
Tattersall, Edward G., 4,135,595, Cl. 180-117.000.

Howard, William S.: *See*—
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Howe, Robert K., to Monsanto Company. Oxadiazol-3-yl-benzoates as plant growth regulants. 4,135,910, Cl. 71-92.000.

Hoy, David R.: *See*—
Parish, Harold C.; Spulgis, Ivars S.; Hickey, Thomas N.; and Hoy, David R., 4,135,896, Cl. 55-270.000.

Hradil, Jiri: *See*—
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Hrboticky, Karel: *See*—
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Hruza, Denis E., Sr.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,208, Cl. 426-538.000.

Hsieh, Henry L.; and Naylor, Floyd E., to Phillips Petroleum Company. Block copolymers. 4,136,137, Cl. 260-880.00B.

Huber, Johann, to Knorr-Bremse GmbH. Accelerator device for control valve of an air brake system for a railway vehicle. 4,135,768, Cl. 303-68.000.

Huber, Wolfgang; and Feuerer, Ludwig, to SKF Kugellagerfabriken GmbH. Spherical end bearing having two or more zones of hydrodynamically acting grooves. 4,135,771, Cl. 308-9.000.

Hubner, Manfred; Heerdt, Ruth; Bosies, Elmar; Kuhnle, Hans; and Schmidt, Felix H., to Boehringer Mannheim GmbH. Hypoglycaemically and hypolipidaemically effective n-substituted carboxylic acid amides. 4,136,197, Cl. 424-319.000.

Hubner, Manfred: *See*—
Haeckel, Rainer; Oellerich, Michael; Heerdt, Ruth; Hubner, Manfred; and Kuhnle, Hans, 4,136,196, Cl. 424-319.000.

Hudson, Marshall C., to Corning Glass Works. Variable ratio optical junction device. 4,135,779, Cl. 350-96.150.

Hughes Aircraft Company: *See*—
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Hughes, Allan R.; McCrudden, Joseph E.; and Mayes, Barry J. R., to Interox Chemicals Limited. Process for bleaching dark fish meat. 4,136,204, Cl. 426-261.000.

Hughes, John J.; Lis, Theodore F.; Turner, John W.; and Bliss, Joseph P., to Kearney & Trecker Corporation. Toolholder clamp for machine tools. 4,135,848, Cl. 408-239.00A.

Hughes, John R., to Raychem Corporation. Heat recoverable coupling for tubing. 4,135,743, Cl. 285-115.000.

Hughes, Ralph L. Golf swing muscle developer. 4,135,714, Cl. 272-136.000.

Hultgren, K. Sten R.; and Sundmar, J. P. Goran, to Aktiebolaget Bofors. Loading device for a firearm. 4,135,433, Cl. 89-47.000.

Hunt, Donald F.; and Stafford, George C., Jr., to University of Virginia. Positive and negative ion recording system for mass spectrometer. 4,136,280, Cl. 250-292.000.

Hunter, Alexander, to Transaction Management, Inc. Automatic tensioning mechanism for a continuous web. 4,135,676, Cl. 242-67.200.

Hunter, Edwin J.; Hunter, Richard E.; and Cudworth, Richard W., to

Toro Company, The. Speed control means for center pivot irrigation system. 4,135,539, Cl. 137-1.000.
Hunter, George L. K.; and Clark, Benjamin C., Jr., to Coca-Cola Company, The. M-Menthenone and process for its production. 4,136,119, Cl. 260-586.00R.
Hunter, Richard E.: *See—*
Hunter, Edwin J.; Hunter, Richard E.; and Cudworth, Richard W., 4,135,539, Cl. 137-1.000.
Hurlemann, Ernst; and Bosshard, Werner, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Breechblock for an automatic firing weapon. 4,135,434, Cl. 89-181.000.
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Resh, Mark S., 4,135,664, Cl. 235-475.000.
Huston, Harvey L.: *See—*
Beery, John C.; Huston, Harvey L.; and Signature Systems, Inc., 4,136,364, Cl. 360-28.000.
Hutchings, David A., to Goodyear Tire & Rubber Company, The. Use of water soluble metallo phthalocyanines as oxidation catalysts. 4,136,123, Cl. 568-565.000.
Hutchinson, Carl P.: *See—*
Nelson, Paul M.; and Hutchinson, Carl P., 4,135,577, Cl. 166-241.000.
Hutzler, Lawrence R.; and Uldall, Falle, to Hutzler Manufacturing Company, Inc. Nestable sifter. 4,136,022, Cl. 209-357.000.
Hutzler Manufacturing Company, Inc.: *See—*
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Huygelen, Constant: *See—*
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Ichikawa, Hisashi; and Ogiro, Kenji, to Hitachi, Ltd. Device or arrangement of parts for elastically loading movable member. 4,135,413, Cl. 74-529.000.
Ichimatsu, Eizi: *See—*
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ICI Australia Limited: *See—*
Walliczek, Erwin G., 4,136,172, Cl. 424-141.000.
ICT Instruments, Inc.: *See—*
Di Giovanni, Mario, 4,135,408, Cl. 73-721.000.
Ide, Jushi: *See—*
Okada, Masakazu; Ide, Jushi; Yasumoto, Seiichi; and Fushimi, Hitoshi, 4,136,384, Cl. 364-200.000.
Iinuma, Kazuhiro: *See—*
Takamizawa, Kinya; and Iinuma, Kazuhiro, 4,136,325, Cl. 340-1.00R.
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Ikeda, Eizo, to Mizuno Sporting Goods, Co., Ltd. Sports shoes equipped with cleats. 4,135,317, Cl. 36-134.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Zoom lens system. 4,135,786, Cl. 350-184.000.
Ikuta, Shigeru; Horiuchi, Yoshifumi; Misaki, Hideo; Matsuura, Kazuo; Imamura, Shigeyuki; and Muto, Naoki, to Toyo Jozo Kabushiki Kaisha. Choline oxidase. 4,135,980, Cl. 195-62.000.
Illinois Railway Equipment Company: *See—*
Adler, Franklin P., 4,135,608, Cl. 188-210.000.
Illinois Tool Works Inc.: *See—*
Barth, Gerald D., 4,135,777, Cl. 339-246.000.
Illis, Alexander; and Renzoni, Louis S., to International Nickel Company, Inc., The. Thermal concentration of non-ferrous metal values in sulfide minerals. 4,135,913, Cl. 75-21.000.
Imamoto, Tsunehiko: *See—*
Minami, Kazuto; Tsukui, Norihiko; and Imamoto, Tsunehiko, 4,136,224, Cl. 428-161.000.
Imamura, Shigeyuki: *See—*
Ikuta, Shigeru; Horiuchi, Yoshifumi; Misaki, Hideo; Matsuura, Kazuo; Imamura, Shigeyuki; and Muto, Naoki, 4,135,980, Cl. 195-62.000.
Imbert, Pierre L., to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Device for drying wrapped rod-shaped products, in particular cigars. 4,135,311, Cl. 34-57.00E.
Imperial Chemical Industries Limited: *See—*
Appleyard, George D.; Caunt, Anthony D.; Fortuin, Michael S.; and Heggs, Thomas G., 4,136,243, Cl. 526-139.000.
Candlin, John P.; and Segal, John A. A. G., 4,136,057, Cl. 252-429.00B.
In Situ Technology, Inc.: *See—*
Terry, Ruel C., 4,135,578, Cl. 166-245.000.
Inaba, Yoshihito: *See—*
Morishita, Masataka; Fukushima, Mitsuru; and Inaba, Yoshihito, 4,135,943, Cl. 106-209.000.
Inamura, Toshio: *See—*
Shimojo, Hirokazu; and Inamura, Toshio, 4,136,301, Cl. 315-209.00T.
Industrial Filter & Pump Mfg. Co.: *See—*
MacQuilkin, Arthur E.; Kulousek, Elmer J.; and Borre, Earl A., 4,135,640, Cl. 220-316.000.
Inoue, Hajime: *See—*
Suzuki, Takeshi; Murao, Mikio; Utiyama, Susumu; Hatanaka, Kyohei; and Inoue, Hajime, 4,135,904, Cl. 65-27.000.
Insituform International Inc.: *See—*
Wood, Eric, 4,135,958, Cl. 156-199.000.
Institut Kardiologii Imeni A.L. Myasnikova Akademii Meditsinskikh Nauk SSSR: *See—*
Chazov, Evgeny I.; Ruda, Mikhail Y.; Burynin, Vitaly A.; and Lokshin, Moisei A., 4,135,496, Cl. 128-1.00D.
International Beauty Distributor: *See—*
Matranga, Eve; and Hokama, Yosh, 4,135,526, Cl. 132-73.000.
International Business Machines Corporation: *See—*
Annunziata, Eugene J.; James, Robert S.; and Tan, Kwang G., 4,136,386, Cl. 364-200.000.
Chang, Augustine W.; and Gaind, Arun K., 4,135,954, Cl. 148-187.000.
Davidson, Arthur; and Herrell, Dennis J., 4,136,290, Cl. 307-277.000.
Gannon, Patrick M.; Heller, Andrew R.; and Smith, Ronald M., 4,136,385, Cl. 364-200.000.
Gniewek, John J.; Reith, Timothy M.; Sullivan, Michael J.; and White, James F., 4,135,998, Cl. 204-192.00E.
Kolpek, Robert A.; MacDuffee, David L.; and Rosenbaum, Walter S., 4,136,395, Cl. 364-518.000.
Neville, Mark H.; and Taylor, Thomas S., 4,136,345, Cl. 346-75.000.
Patel, Tulsidas R., 4,136,293, Cl. 310-13.000.
International Flavors & Fragrances Inc.: *See—*
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,135,520, Cl. 131-17.00R.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,208, Cl. 426-538.000.
International Harvester Company: *See—*
Chatterjea, Probir K., 4,135,610, Cl. 192-4.00A.
International Nickel Company, Inc., The: *See—*
Ettel, Victor A.; Devuyst, Eric A. P.; Sridhar, Ramamritham; and O'Neill, Charles E., 4,135,918, Cl. 75-117.000.
Illis, Alexander; and Renzoni, Louis S., 4,135,913, Cl. 75-21.000.
Sullivan, Arthur F.; and Currie, William E., 4,135,395, Cl. 73-194.00B.
Turillon, Pierre P.; and Sandrock, Gary D., 4,135,621, Cl. 206-0.700.
International Paper Co.: *See—*
Lowdermilk, Loren L., 4,135,347, Cl. 53-574.000.
International Standard Electric Corporation: *See—*
Archer, John D., 4,135,781, Cl. 350-96.200.
Briese, Wolfgang, 4,136,297, Cl. 310-353.000.
Foster, Basil B.; and Hirst, Ian J., 4,136,267, Cl. 179-170.00A.
Scott, Brian J., 4,136,307, Cl. 318-677.000.
International Telephone and Telegraph Corporation: *See—*
Grillo, Richard J.; and Castellano, Carmine T., 4,135,829, Cl. 366-337.000.
November, Milton H., 4,135,383, Cl. 73-32.00A.
Internationale Octrooi Maatschappij "Octropa" B.V.: *See—*
Parry, Stephen H.; and Porter, Philip, 4,136,167, Cl. 424-87.000.
Interox Chemicals Limited: *See—*
Hughes, Allan R.; McCrudden, Joseph E.; and Mayes, Barry J. R., 4,136,204, Cl. 426-261.000.
InterRoyal Corporation: *See—*
Clarke, Samuel C.; and Losinski, Edward, 4,135,690, Cl. 248-188.200.
Intersil, Inc.: *See—*
Jaffe, James M.; and Penton, Jack I., 4,135,292, Cl. 29-578.000.
IRECO Industries, Inc.: *See—*
Clements, Lloyd W., 4,135,738, Cl. 285-5.000.
Irick, Gether, Jr.; and Wang, Richard H. S., to Eastman Kodak Company. Piperidinyl hydrogen alkylene or arylene phosphates and metal salts thereof which compounds are useful as ultraviolet stabilizers for organic compositions. 4,136,083, Cl. 252-400.00A.
Isakov, Evgeny A.: *See—*
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Ishiguro, Shoji: *See—*
Yoneyama, Masakazu; Fuseya, Yoshiharu; Kato, Norihiko; Sasaoka, Senzo; and Ishiguro, Shoji, 4,135,931, Cl. 96-66.300.
Ishii, Mitsuaki: *See—*
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,136,333, Cl. 340-147.00C.
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-Ya; and Ono, Shin-etu, to Daiichi Seiyaku Co., Ltd. Treatment of diabetes with 2-substituted-1,3-diazacyclic compounds. 4,136,188, Cl. 424-273.00R.
Ishikawa, Tatsuo; and Ichikawa, Hachiro, to Nippon Light Metal

Company Limited. Process for electrolytically producing aluminum. 4,135,994, Cl. 204-67.000.

Ishikawa, Yasushi: *See*—
Eujita, Haruo; Ishikawa, Yasushi; Tachikawa, Hiroshi; and Nakamura, Taizo, 4,136,273, Cl. 219-121.00P.

Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,136,320, Cl. 333-82.0BT.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,135,876, Cl. 432-14.000.
Tsuzi, Shoichi; Aoki, Kiyoshi; Sakai, Takeshi; Ikebe, Hiroshige; and So, Dogi, 4,135,874, Cl. 431-115.000.

Ishimaru, Rakuichi. Device for converting rocking motion into reciprocating rotary motion. 4,135,409, Cl. 74-76.000.

Itou, Takaaki: *See*—
Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,136,139, Cl. 261-44.00C.

Ivanova, Raisa V.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Iwamoto, Atsuo: *See*—
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,135,933, Cl. 96-100.00R.

Iwata Electric Works, Ltd.: *See*—
Nakamoto, Yakayuki, 4,135,284, Cl. 29-229.000.

J. M. Huber Corporation: *See*—
Carson, Forrest L.; and Rives, Joe F., 4,135,859, Cl. 417-9.000.

J.M. Voith GmbH: *See*—
Bartmann, Bernhard, 4,135,674, Cl. 242-64.000.

Jack Barnes Engineering, Inc.: *See*—
Barnes, Carl K.; and Barnes, John O., 4,135,447, Cl. 101-177.000.

Jackle, William A.; Mazzeo, Michael P.; and Gillis, Marina N., to Thiokol Corporation. Polyurethane curing agents. 4,136,092, Cl. 528-60.000.

Jackson, Marquis A. Record keeping ticket issuing machine. 4,135,613, Cl. 194-2.000.

Jacobsen Manufacturing Company: *See*—
Akgulian, Sahag C., 4,135,351, Cl. 56-255.000.

Jaeger, C. Rene: *See*—
Blackmer, David E.; and Jaeger, C. Rene, 4,136,314, Cl. 328-167.000.

Jaffe, James M.; and Penton, Jack I., to Intersil, Inc. Integrated circuit contact and method for fabricating the same. 4,135,292, Cl. 29-578.000.

Jager, Horst; and Wegmuller, Hans, to Ciba-Geigy Corporation. Boric acid/amine reaction products, their manufacture and use. 4,136,039, Cl. 252-8.800.

Jahn, Walter: *See*—
Scholz, Hansjuergen; Jahn, Walter; and Gimbel, Juergen, 4,135,737, Cl. 280-747.000.

Jakobsen, Ole M., to A/S Kobenhavns Pektinfabrik. Apparatus for the recovery of liquid from a liquid medium containing solids. 4,136,031, Cl. 210-267.000.

Jalan, Vinod M.; and Bushnell, Calvin L., to United Technologies Corporation. Method for producing highly dispersed catalytic platinum. 4,136,059, Cl. 252-447.000.

James D. Pauls & Associates, Ltd.: *See*—
Antenore, Ronald L., 4,136,338, Cl. 340-551.000.

James, Gregory A.: *See*—
Rardin, Jack A.; and James, Gregory A., 4,135,624, Cl. 206-425.000.

James, Robert S.: *See*—
Annunziata, Eugene J.; James, Robert S.; and Tan, Kwang G., 4,136,386, Cl. 364-200.000.

Jansen, Jacobus: *See*—
Bakx, Cornelis A. C. L.; van Goolen, Jacobus T. J.; Jansen, Jacobus; and Kuiper, Hubertus G., 4,135,881, Cl. 23-230.0PC.

Jansson, Eric O.; Naucler, Bengt O.; and Asberg, Thomas, to Aktiebolaget Karlstads Mekaniska Werkstad. Stay ring for the spiral casing of a rotary hydraulic machine. 4,135,853, Cl. 415-204.000.

Jarvinen, Philip, to Sanders Associates, Inc. Solar energy conversion system. 4,135,489, Cl. 126-270.000.

Jensen, Karsten. Blocking-up wedge. 4,135,335, Cl. 52-126.000.

Jeong, Henry J.: *See*—
Mangiardi, Vito J.; Jeong, Henry J.; and Lewin, Nathan, 4,135,880, Cl. 23-230.00B.

Jin, Kiyoshi: *See*—
Katayama, Shitomi; Koyama, Nobuaki; Shimabukuro, Hajime; and Jin, Kiyoshi, 4,136,079, Cl. 260-37.00N.

Johnson & Johnson: *See*—
Korpman, Ralf, 4,136,071, Cl. 260-27.0BB.

Johnson, Matthey & Co., Limited: *See*—
Day, Joseph G., 4,135,923, Cl. 75-153.000.

Johnson, Norman A.; and Kent, Raymond C., to Armstrong Cork Company. Roll-on ceiling for manufactured homes. 4,135,341, Cl. 52-316.000.

Johnson, R. W.; and Day, George E. Wheel assembly with air cooling means. 4,135,764, Cl. 301-6.0CS.

Johnson, Wayne F.: *See*—
Meyer, Raymond J.; Johnson, Wayne F.; and Wodehouse, Richard A., 4,136,026, Cl. 210-45.000.

Johnston, James D.; Starrett, Richmond M.; and Sanders, Robert N., to Ethyl Corporation. Process for preparation of organic acid halide. 4,136,113, Cl. 260-544.00Y.

Jonas, Adam: *See*—
Borger, Gotz-Gerald; Jonas, Adam; and Germerdonk, Rolf, 4,135,891, Cl. 55-59.000.

Jones, Allen, Jr. Steering and stabilization apparatus for aircraft. 4,135,687, Cl. 244-90.00R.

Jones, Charles B.: *See*—
Smith, Donald E.; and Jones, Charles B., 4,136,118, Cl. 260-578.000.

Jones, Ira D. Scope for viewing the internal surface of a bore or similar cavity. 4,135,824, Cl. 356-241.000.

Jones, Joseph; Pang, Steven J.; and Woodard, Roland L., Jr., to Jones, Joseph; and Woodard, Roland L., Jr. Golf yardage indicator system. 4,136,394, Cl. 364-561.000.

Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., to Betz Laboratories, Inc. Method for treating aqueous mediums. 4,136,152, Cl. 423-242.000.

Jones, Thomas R.: *See*—
Gunter, Josef K.; Jones, Thomas R.; and Dabbs, Phillip E., 4,135,275, Cl. 19-107.000.

Jonnes, Nelson, to Minnesota Mining and Manufacturing Company. Thermally insulating sheet material. 4,136,222, Cl. 428-116.000.

Jordan, Donald J. Tensiometer. 4,135,393, Cl. 73-144.000.

Jorzenink, Erich; and Stanke, Walter, to Krupp-Koppers GmbH. Apparatus for cleaning the bottom surface of a coke oven door plug. 4,135,987, Cl. 202-241.000.

Joseph, A. David; and Ward, Elmer E., to Sealed Power Corporation. Transmission fluid filter and method for manufacture thereof. 4,136,011, Cl. 210-168.000.

Jouets Educatifs Universels: *See*—
Gresset, Bernard F., 4,135,303, Cl. 33-18.00R.

Joyce, Arthur W., to Dennison Manufacturing Co. Webbed harnessing device. 4,136,148, Cl. 264-291.000.

Juan, Francois A.: *See*—
Capdevila, Claudio; Juan, Francois A.; Venditti, Gaetan; and Alquier, Michel E. L., 4,135,695, Cl. 249-118.000.

Julian, Ronald G.: *See*—
Stoner, David L.; Shield, Charles F., III; Julian, Ronald G.; and Koegel, Ewald, 4,135,494, Cl. 128-1.00R.

Jund, Hans: *See*—
Koch, Wilhelm; and Jund, Hans, 4,135,453, Cl. 105-131.000.

Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, to BASF Aktiengesellschaft. Salts of phosphonic acids. 4,135,909, Cl. 71-86.000.

Kabushiki Kaisha Sigma Electronics Planning: *See*—
Shimojo, Hirokazu; and Inamura, Toshio, 4,136,301, Cl. 315-209.00T.

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Mizuno, Yoshio, 4,135,682, Cl. 242-107.40B.

Kaczmarek, Thomas D.; and Wengrzyn, Richard J., to Westinghouse Electric Corp. Use of an expansion chamber for the production of representative particulate effluent from polymers. 4,135,399, Cl. 73-339.00R.

Kadota, Shozo; and Fujimoto, Yoshiji, to Hitachi, Ltd. Device for detecting displacement between patterns. 4,136,332, Cl. 340-146.30H.

Kahan, Frederick M.: *See*—
Kahan, Jean S.; and Kahan, Frederick M., 4,135,978, Cl. 195-29.000.

Kahan, Jean S.; and Kahan, Frederick M., to Merck & Co., Inc. Production of N-acyl-thienamycins. 4,135,978, Cl. 195-29.000.

Kahng, Dawon: *See*—
Brews, John R.; and Kahng, Dawon, 4,135,289, Cl. 29-571.000.

Kaiya, Atsushi; Arai, Eizo; Kawaguchi, Hideo; and Miyazaki, Kazuo, to Nippon Oil Co., Ltd. Method for recovering low molecular weight polymers. 4,136,088, Cl. 260-669.00P.

Kamarian, Georgy M.; Kostandov, Leonid A.; and Zimin, Vladimir M. Solid electrode electrolyzer for electrolysis of aqueous solutions. 4,136,004, Cl. 204-256.000.

Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,208, Cl. 426-538.000.

Kameda, Hidetoshi: *See*—
Abe, Kiyomi; and Kameda, Hidetoshi, 4,136,336, Cl. 340-365.00S.

Kameda, Kin-Ya: *See*—
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-Ya; and Ono, Shin-etu, 4,136,188, Cl. 424-273.00R.

Kamei, Tatsuya: *See*—
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Kami, Seiji; and Stefferson, Warren A., to United States of America, Air Force. Method of joining a fine wire filament to a connector. 4,135,296, Cl. 29-628.000.

Kamm, Gerard R.; Milks, David; Kearns, James D.; Britt, Herbert I.;

and Khavarian, Cyrus R., to Union Carbide Corporation. Process for the thermal cracking of hydrocarbons. 4,136,015, Cl. 208-129.000.

Kanbe, Chiharu: *See*—
Fukuyo, Junji; Kanbe, Chiharu; Ohike, Yasuaki; and Oguri, Tuneji, 4,135,405, Cl. 73-499.000.

Kandler, Joachim: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; and Klose, Werner, 4,136,154, Cl. 423-265.000.

Kane, Bernard J.: *See*—
Hirschy, Linda M.; Kane, Bernard J.; and Traynor, Sean G., 4,136,126, Cl. 260-666.00A.

Kanebo, Ltd.: *See*—
Aikawa, Akira; Oguchi, Masao; Takeda, Toshihide; Kisaichi, Akio; and Saito, Toshio, 4,135,877, Cl. 8-115.500.

Kaneko, Hideaki: *See*—
Muro, Kakuro; Yashiro, Kuniji; Kaneko, Hideaki; and Yamazaki, Kiyoichi, 4,136,073, Cl. 260-29.2EP.

Kaplan, Ruth. Bell actuating mechanism. 4,135,474, Cl. 116-155.000.

Karl Schmidt GmbH: *See*—
Reitz, Johannes; Stark, Erich; and Schneck, Dieter, 4,135,479, Cl. 123-73.0AA.

Karnis, Alkibiadis; and Wood, John R., to Domtar Inc. Specific surface fractionator. 4,135,389, Cl. 73-61.400.

Karrip, Alexander A.: *See*—
Rensland, Thomas E.; and Karrip, Alexander A., 4,135,836, Cl. 403-120.000.

Katayama, Shitomi; Koyama, Nobuaki; Shimabukuro, Hajime; and Jin, Kiyoshi, to NHK Spring Co., Ltd. Urea compound having carboxylate radical and method for producing the same. 4,136,079, Cl. 260-37.00N.

Kato, Norihiko: *See*—
Yoneyama, Masakazu; Fuseya, Yoshiharu; Kato, Norihiko; Sasaoka, Senzo; and Ishiguro, Shoji, 4,135,931, Cl. 96-66.300.

Kawada, Yoshinosuke: *See*—
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,135,491, Cl. 126-270.000.

Kawaguchi, Hideo: *See*—
Kaiya, Atsushi; Arai, Eizo; Kawaguchi, Hideo; and Miyazaki, Kazuo, 4,136,088, Cl. 260-669.00P.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Suzuki, Takeshi; Murao, Mikio; Utiyama, Susumu; Hatanaka, Kyohei; and Inoue, Hajime, 4,135,904, Cl. 65-27.000.

Kawasaki, Masahiro: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Nomura, Katsuhiko, 4,135,795, Cl. 354-23.00D.

Kayanuma, Kiyokazu: *See*—
Sone, Tadatoshi; and Kayanuma, Kiyokazu, 4,135,873, Cl. 425-147.000.

Kazan, John, to American Cyanamid Company. Process for preparing dialkyl (p-aminobenzoyl) glutamates. 4,136,101, Cl. 260-429.900.

Kearney & Trecker Corporation: *See*—
Hughes, John J.; Lis, Theodore F.; Turner, John W.; and Bliss, Joseph P., 4,135,848, Cl. 408-239.00A.

Kearns, James D.: *See*—
Kamm, Gerard R.; Milks, David; Kearns, James D.; Britt, Herbert I.; and Khavarian, Cyrus R., 4,136,015, Cl. 208-129.000.

Kefalas A/S: *See*—
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Kelsey-Hayes Co.: *See*—
Brown, Donald D.; and Trindle, Terry L., 4,135,607, Cl. 188-161.000.

Kennametal Inc.: *See*—
McCray, David M.; and Gulibon, Robert S., 4,135,418, Cl. 82-36.00A.

Kennard, John M., to GEC Mechanical Handling Limited. Kinetic energy monitor. 4,135,915, Cl. 75-60.000.

Kennedy, Joseph P.: *See*—
Dreyfuss, Patricia; and Kennedy, Joseph P., 4,136,136, Cl. 260-878.00R.

Kennedy, Melvin, to Nagel/Kennedy & Associates. Vehicle with spring motor operable in running and rewind modes. 4,135,329, Cl. 46-206.000.

Kennedy, William S., to Acurex Corporation. Parabolic trough solar energy collector assembly. 4,135,493, Cl. 126-271.000.

Kent, Frederick M.; and Sokol, Michael, to Bio/Data Corporation. Platelet aggregation monitoring device. 4,135,818, Cl. 356-39.000.

Kent, Raymond C.: *See*—
Johnson, Norman A.; and Kent, Raymond C., 4,135,341, Cl. 52-316.000.

Kephart, Gerald W.; and White, Stanley A., to Rockwell International Corporation. Input phase modulation correction for charge-transfer-device analog shift registers. 4,136,287, Cl. 307-221.00D.

Kershenbaum, Naum Y.: *See*—
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.

Kertscher, Eberhard, to Maillefer S.A. Installation for extruding plastics. 4,135,825, Cl. 366-79.000.

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Doane, Patrick K.; and Springston, David R., 4,135,425, Cl. 84-1.130.

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Ogiro, Kenji; Hashizume, Shin; Miyakawa, Seii; and Kishi, Masaya, 4,136,366, Cl. 360-96.000.

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Skalny, Jan P.; and Klemm, Waldemar A., 4,135,941, Cl. 106-100.000.

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Hosoda, Taisei; Uzuhashi, Hideo; Kobayashi, Nobuyuki; and Tanaka, Masaaki, 4,135,370, Cl. 62-274.000.

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Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,135,876, Cl. 432-14.000.

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Brown, Francis B.; Erickson, John W.; and Petrie, Harold L., 4,135,861, Cl. 417-183.000.

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Katayama, Shitomi; Koyama, Nobuaki; Shimabukuro, Hajime; and Jin, Kiyoshi, 4,136,079, Cl. 260-37.00N.

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Coupek, Jiri; Lukas, Jaromir; Hradil, Jiri; and Krivakova, Miroslava, 4,135,892, Cl. 55-67.000.

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Jorzenink, Erich; and Stanke, Walter, 4,135,987, Cl. 202-241.000.
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Kuiper, Hubertus G.: *See*—
Bakx, Cornelis A. C. L.; van Goolen, Jacobus T. J.; Jansen, Jacobus; and Kuiper, Hubertus G., 4,135,881, Cl. 23-230.0PC.

Kulesza, Janusz; Miler, Kazimierz; Podlejski, Jerzy; Gora, Jozef; Czajkowska, Teresa; Kozlowski, Zbigniew; Kolska, Jadwiga; Stolowska, Jolanta; and Rutkowski, Zygmunt, to Politechnika Lodzka, Instytut Brzemyuslu Miesnego. Method of obtaining a smoking agent. 4,136,206, Cl. 426-431.000.

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MacQuilkin, Arthur E.; Kulousek, Elmer J.; and Borre, Earl A., 4,135,640, Cl. 220-316.000.
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Kiritani, Yoshio; and Tsuyuguchi, Michio, 4,135,983, Cl. 201-25.000.
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Kyburz, Emilio; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Tricyclic compounds. 4,136,116, Cl. 260-570.800.
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Lamlee, Stewart. Seedling sprouter. 4,135,331, Cl. 47-61.000.
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Lancellotti, William E. Golf putter practice device. 4,135,720, Cl. 273-186.00A.
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Lanphear, Marvin P. Rigid chain system for constructing articles. 4,135,689, Cl. 248-188.100.
Larime, Carl M., to General Signal Corporation. Buzzer assembly. 4,136,337, Cl. 340-384.00R.
La Rocca, Aldo, to FIAT Societa per Azioni. Desalination of salt water by solar energy means. 4,135,985, Cl. 202-176.000.
Larrick, Robert B. Rear screen optic projection apparatus. 4,135,784, Cl. 350-122.000.
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Lask, Helmut: *See*—
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Lassota, Marek J. Rotary compressor and process of compressing compressible fluids. 4,135,864, Cl. 418-1.000.
Latina, Roland N.; and Mitchell, Hal D., to A-T-O Inc. Shoulder pad. 4,135,252, Cl. 2-2.000.
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Uchida, Shinya; Moriyama, Sinai; and Yoshida, Minoru, 4,135,709, Cl. 271-95.000.
Lawrie, Eugene G.: *See*—
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LeBreton, Albert F., to Westinghouse Electric Corp. Temperature measurement system for hollow shaft interiors. 4,135,401, Cl. 73-351.000.
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Ruetschi, Paul, 4,136,236, Cl. 429-206.000.
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Boudart, Michel; and Lam, Yiu-Lau, 4,136,062, Cl. 252-460.000.
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Lestradet, Maurice. Itinerary following device for a vehicle. 4,135,594, Cl. 180-98.000.
Leunissan, Henry P. Dental massage device. 4,135,501, Cl. 128-66.000.
Lever Brothers Company: *See*—
Mazzola, Louis R., 4,136,052, Cl. 252-94.000.
Levert, Francis E.: *See*—
Cox, Samson A.; and Levert, Francis E., 4,136,282, Cl. 250-336.000.
Levy, Stephen D.: *See*—
Diehl, Robert E.; Levy, Stephen D.; and Gastrock, William H., 4,136,117, Cl. 260-577.000.
Lewallyn, Michael. Firing nipple. 4,135,321, Cl. 42-83.000.
Lewin, Nathan: *See*—
Mangiardi, Vito J.; Jeong, Henry J.; and Lewin, Nathan, 4,135,880, Cl. 23-230.00B.
Lewis, J. Stephen: *See*—
Sapkus, Jurgis; and Lewis, J. Stephen, 4,135,327, Cl. 46-161.000.
Lewis, Jon; and Shea, Philip J., to Dow Chemical Company, The. Triazolopyridazines used to alleviate bronchial spasms. 4,136,182, Cl. 424-248.540.
Lewis, Nathanial H. Capillary action brake shoe: vacuum suction type. 4,135,606, Cl. 188-24.000.
Li, George S., to Standard Oil Company, The. Thermoplastic acrylonitrile copolymers. 4,136,246, Cl. 526-267.000.
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., to Allied Chemical Corporation. Method and apparatus for texturizing continuous filaments. 4,135,280, Cl. 28-257.000.
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Gladieux, Norman K.; Herrington, Richard A.; and Oelke, Waldemar W., 4,135,906, Cl. 65-348.000.
Lichtman, Marshall A.; and Brennan, James K. Obtaining human cell lines that elaborate colony stimulating activity for marrow cells of man and other species and methods of preparing same. 4,135,975, Cl. 195-1.800.
Liebscher, Johannes; and Schulein, Rolf G., to Leifheit International Gunter Leifheit GmbH. Corkscrew. 4,135,415, Cl. 81-3.38A.
Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., to International Flavors & Fragrances Inc. Tobacco flavoring with cyclohexadiene derivatives. 4,135,520, Cl. 131-17.00R.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Process for the preparation of butenoyl norbornenes. 4,136,120, Cl. 260-586.00G.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors &

Fragrances Inc. Flavoring with substituted norbornane derivatives. 4,136,208, Cl. 426-538.000.
Light, Stanley C., Jr.; and Privoznik, Louis J., to Westinghouse Electric Corp. Automatic flame cutter for mitres with constant angle bevels on a pipe. 4,135,701, Cl. 266-57.000.
Liland, Alfred L.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,135,280, Cl. 28-257.000.
Limegrover, John K. Floating swimming pool. 4,135,256, Cl. 4-171.000.
Lin, Song-Ling; and Pramoda, Maturu K., to American Home Products Corp. Xanthan gum therapeutic compositions. 4,136,177, Cl. 424-211.000.
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Pramoda, Matura K.; and Lin, Song-Ling, 4,136,173, Cl. 424-177.000.
Lincoln Associates, Inc.: *See*—
Lincoln, F. William, 4,135,778, Cl. 350-38.000.
Lincoln, F. William, to Lincoln Associates, Inc. Microscope lens system. 4,135,778, Cl. 350-38.000.
Lindell, Albert H.: *See*—
Dillon, Glenn W.; and Lindell, Albert H., 4,135,639, Cl. 220-288.000.
Lindeman (Holdings) Limited: *See*—
Baldwin, Richard D.; and Edwards, Stanley E., 4,135,649, Cl. 222-511.000.
Lindquist, Thomas R., to U.S. Philips Corporation. Data acquisition system for computed tomography. 4,136,388, Cl. 364-414.000.
Lis, Theodore F.: *See*—
Hughes, John J.; Lis, Theodore F.; Turner, John W.; and Bliss, Joseph P., 4,135,848, Cl. 408-239.00A.
Lischke, Burkhard: *See*—
Anger, Klaus; Lischke, Burkhard; Oelmann, Andreas; and Reschke, Helmut, 4,136,285, Cl. 250-492.00A.
Little Giant Corporation: *See*—
Davis, Lee W.; Hollingsworth, James S.; and Roberts, Leo L., 4,135,863, Cl. 417-420.000.
Litton Industrial Products, Inc.: *See*—
Cheney, Bruce R., 4,135,530, Cl. 134-60.000.
Liu, Hsing-Ching; and Liu, Lan-dih. Educational toy with action. 4,135,313, Cl. 35-9.00C.
Liu, Lan-dih: *See*—
Liu, Hsing-Ching; and Liu, Lan-dih, 4,135,313, Cl. 35-9.00C.
Lockwood, Alan C.; and Stock, Glenn A., to Norris Industries, Inc. Electrical junction and outlet box. 4,135,633, Cl. 220-3.940.
Loewy, Thomas R.; and Tuttle, Pat R. Toy glider and target game. 4,135,718, Cl. 273-95.00B.
Lof, Lance G. A. Floating pool cover. 4,135,257, Cl. 4-172.120.
Loire, Rene; and Guillaume, Daniel, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Means of protection against the shocks of ships coming alongside, particularly for platforms of the off-shore type. 4,135,467, Cl. 114-219.000.
Lokshin, Moisei A.: *See*—
Chazov, Evgeny I.; Ruda, Mikhail Y.; Burynin, Vitaly A.; and Lokshin, Moisei A., 4,135,496, Cl. 128-1.00D.
Long, Richard E.: *See*—
Murphy, Thomas A.; Long, Richard E.; and Tebo, Kenneth L., 4,135,679, Cl. 242-128.000.
Long, William J. Ground plugging device. 4,135,752, Cl. 294-50.700.
Loomba, Yogendra S.: *See*—
Stephenson, Robert L.; Gavagan, James; and Loomba, Yogendra S., 4,135,683, Cl. 242-107.40A.
Lord Corporation: *See*—
McGuire, Dennis P., 4,135,856, Cl. 416-134.00A.
Lorenz, Leo J.; and Asztalos, Auguste, to Massey-Ferguson Inc. Upper link storage clip. 4,135,731, Cl. 280-461.00A.
Lorimor, Larry W., to Caterpillar Tractor Co. Pressure relief and load check valve assembly. 4,135,541, Cl. 137-116.300.
Losinski, Edward: *See*—
Clarke, Samuel C.; and Losinski, Edward, 4,135,690, Cl. 248-188.200.
Louboutin, Robert; and Savall, Vincent, to Degremont. Compact apparatus for the purification of waste water by a physical chemical treatment. 4,136,012, Cl. 210-208.000.
Loveless, Norman P.: *See*—
Rosenberg, Ira E.; Ferguson, John A.; and Loveless, Norman P., 4,135,524, Cl. 132-7.000.
Lowdermilk, Loren L., to International Paper Co. Method and apparatus for producing a dispensing tube. 4,135,347, Cl. 53-574.000.
Loyd, Robert W., Jr., to Curtiss-Wright Corporation. Split-multi-unit rotary combustion engine. 4,135,485, Cl. 123-242.000.
Loyer, Philip K., to Dayco Corporation. Apparatus for producing a continuous flexible tubular conduit. 4,135,869, Cl. 425-71.000.
Lubliner/Saltz, Inc.: *See*—
Saltz, Ira M., 4,135,832, Cl. 402-15.000.
Lubrizol Corporation, The: *See*—
Davis, Kirk E., 4,136,043, Cl. 252-47.500.
Doggett, Roger H.; and Buccigross, Henry L., 4,136,078, Cl. 260-33.20R.
Lucas, David A.: *See*—
Alcock, Robert N.; Lucas, David A.; and Vincent, Richard P., 4,136,342, Cl. 343-113.00R.
Lucas Industries Limited: *See*—
Fowkes, Ronald, 4,135,593, Cl. 180-65.00R.
Lucking, Lawrence M.: *See*—
Frank, John W.; and Lucking, Lawrence M., 4,135,813, Cl. 355-71.000.
Ludwig, Lawrence P.: *See*—
Bill, Robert C.; and Ludwig, Lawrence P., 4,135,851, Cl. 415-174.000.
Ludwig Taprogge, Reinigungsanlagen fur Rohren-Warmeaustauscher: *See*—
Treplin, Friedrich-Wilhelm; and Borchert, Werner, 4,135,574, Cl. 165-95.000.
Luk Lamellen u. Kupplungsbau GmbH: *See*—
Kohlhage, Ernst, 4,135,283, Cl. 29-173.000.
Lukas, Jaromir: *See*—
Coupek, Jiri; Lukas, Jaromir; Hradil, Jiri; and Krivakova, Miroslava, 4,135,892, Cl. 55-67.000.
Luke, John A.; and Haslam, Fred, to British-American Tobacco Company Limited. Tobacco-smoke filters. 4,135,523, Cl. 131-261.00B.
Luo, Fang-Chen; and Brody, Thomas P., to Westinghouse Electric Corp. Method of manufacture of flat panel display device. 4,135,959, Cl. 156-230.000.
Lupke, Gerd P. H.; and Lupke, Manfred A. A. Apparatus for and method of producing corrugated thermoplastic tubing. 4,136,143, Cl. 264-508.000.
Lupke, Manfred A. A.: *See*—
Lupke, Gerd P. H.; and Lupke, Manfred A. A., 4,136,143, Cl. 264-508.000.
Lussling, Theodor; Theissen, Ferdinand; and Weigert, Wolfgang, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of malononitrile. 4,136,108, Cl. 260-465.80R.
Lvovich, Galperin A.: *See*—
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.
Lynch, Francis deS.: *See*—
Sullivan, Paul F.; Lynch, Francis deS.; Gobush, William; and Hottel, Hoyt C., Jr., 4,136,387, Cl. 364-410.000.
Lyons, Bernard J., to Raychem Corporation. Compositions of antioxidants of reduced volatility. 4,136,055, Cl. 252-404.000.
Lyons, Robert J. Stairway stringers. 4,135,508, Cl. 182-194.000.
M&T Chemicals Inc.: *See*—
Hirshman, Justin L.; and Treadwell, Kenneth, 4,136,046, Cl. 252-182.000.
MacDonald, Roderick W.: *See*—
Blieden, Harry R.; and MacDonald, Roderick W., 4,135,537, Cl. 136-89.0PC.
MacDonnell, Robert W.; and Shander, Otto A., to R. W. Mac Company. Railway bolster lug. 4,135,833, Cl. 403-43.000.
MacDuffee, David L.: *See*—
Kolpek, Robert A.; MacDuffee, David L.; and Rosenbaum, Walter S., 4,136,395, Cl. 364-518.000.
Machi, Shinji: *See*—
Manabe, Takao; Machi, Shinji; and Matunaga, Sigetugu, 4,135,459, Cl. 112-121.120.
Mackenzie, Kenneth J., to Babcock & Wilcox Company, The. Off-set welding ring. 4,135,739, Cl. 285-22.000.
MacLeod, John G., to Rockwell International Corporation. Balanced plug valve. 4,135,544, Cl. 137-246.220.
MacQuilkin, Arthur E.; Kulousek, Elmer J.; and Borre, Earl A., to Industrial Filter & Pump Mfg. Co. Safety closure device for a pressure vessel. 4,135,640, Cl. 220-316.000.
Madsen, Peter E.; Lee, James A.; and Armstrong, Derek, to United Kingdom Atomic Energy Authority. Superconducting members and methods of manufacturing thereof. 4,135,293, Cl. 29-599.000.
Maeda, Masakazu: *See*—
Hosokoshi, Kakuichiro; Nakamura, Hiroto; Sato, Akira; and Maeda, Masakazu, 4,135,930, Cl. 96-36.100.
Maezima, Masaaki, to Hitachi, Ltd. Single-phase three-legged core for core type transformer. 4,136,322, Cl. 336-60.000.
Maffrand, Jean-Pierre: *See*—
Frehel, Daniel; and Maffrand, Jean-Pierre, 4,136,186, Cl. 424-256.000.
Magiera, Helmut: *See*—
Muller, Anton; Konig, Hubert; and Magiera, Helmut, 4,135,564, Cl. 152-182.000.
Magnus & Co. A/S: *See*—
Magnus, Hans P., 4,135,732, Cl. 280-610.000.
Magnus, Hans P., to Magnus & Co. A/S. Skis. 4,135,732, Cl. 280-610.000.
Maguire, Edward J., Jr.: *See*—
Gault, Terrell W.; and Maguire, Edward J., Jr., 4,136,045, Cl. 252-135.000.
Mahler, Charles J.: *See*—
Taylor, Thomas N.; and Mahler, Charles J., 4,135,805, Cl. 355-3.00R.
Maillefer S.A.: *See*—
Kertscher, Eberhard, 4,135,825, Cl. 366-79.000.
Mailliet, Pierre H., to S.A. des Anciens Etablissements Paul Wurth. Taphole sealing apparatus. 4,135,705, Cl. 266-273.000.
Malafeev, Alexandr N.: *See*—
Bogomolov, Boris N.; Kiselev, Anatoly V.; and Malafeev, Alexandr N., 4,136,035, Cl. 210-388.000.
Malan, Johannes D.; and Thirion, Jacobus C., to Tobacco Research & Development Institute Limited. Tobacco products and methods for their preparation. 4,135,521, Cl. 131-141.000.

Malavasi, Alberto. Modular elements for covering floors and walls with tiles and the like. 4,135,338, Cl. 52-387.000.

Malott, John O. Coordinated and integrated fuel and auxiliary-exhaust system for internal combustion engines for automobiles. 4,135,484, Cl. 123-198.00F.

Manabe, Takao; Machi, Shinji; and Matunaga, Sigetugu, to Toshiba Kikai Kabushiki Kaisha. Automatic sewing machine. 4,135,459, Cl. 112-121.120.

Mangiardi, Vito J.; Jeong, Henry J.; and Lewin, Nathan, to Bio-Rad Laboratories, Inc. Folate assay with ion exchange resin bound-free separation. 4,135,880, Cl. 23-230.00B.

Mann, David R., to Bexford Limited. Process for preparation of photographic film involving corona treatment of polystyrene containing subbing layers and product. 4,135,932, Cl. 96-87.00R.

Mann, Martin R.: *See—*
Chan, Robert H. G.; Mann, Martin R.; and McDonnell, Francis M., 4,136,399, Cl. 364-900.000.

Manns, William G., to Texas Instruments Incorporated. Metal-dielectric electron beam scanning stack. 4,135,281, Cl. 29-25.140.

Manring, William H., to FMC Corporation. Process for glass melting. 4,135,905, Cl. 65-136.000.

Manuccia, Thomas J.: *See—*
Stregack, Joseph A.; and Manuccia, Thomas J., 4,136,317, Cl. 331-94.50G.

Marathon LeTourneau Company: *See—*
Harris, Rudy M.; Wolfe, Roger L.; and Martin, William T., 4,135,628, Cl. 212-14.000.

Marchant, Jack D.: *See—*
Morrice, Edward; and Marchant, Jack D., 4,135,921, Cl. 75-134.00N.

Marchese, Vincent P.: *See—*
Morris, Joseph W.; and Marchese, Vincent P., 4,135,454, Cl. 102-205.000.

Mark Hot Inc.: *See—*
d'Anjou, Marcel, 4,135,850, Cl. 415-148.000.

Marsee, Frederick J., to Ethyl Corporation. Spark vacuum advance control. 4,135,480, Cl. 123-117.00A.

Marston, Laurel L. Mop sterilizer and dryer. 4,135,269, Cl. 15-4.000.

Martin, Albert E.: *See—*
Dilg, Walter C.; and Martin, Albert E., 4,135,629, Cl. 213-153.000.

Martin, Harold B., to Graber-Rogg, Inc. Revolving skipping device and counter. 4,135,713, Cl. 272-74.000.

Martin Marietta Corporation: *See—*
Heffner, Roy W.; and Blanning, Robert B., 4,136,343, Cl. 343-117.00R.
Skalny, Jan P.; and Klemm, Waldemar A., 4,135,941, Cl. 106-100.000.

Martin, William T.: *See—*
Harris, Rudy M.; Wolfe, Roger L.; and Martin, William T., 4,135,628, Cl. 212-14.000.

Martineau, Philippe; and Lallement, Serge, to Regie Nationale des Usines Renault. Arrangement for filling and venting a fuel tank, of an automobile in particular. 4,135,562, Cl. 141-285.000.

Martini, Thomas; and Kluge, Friedhelm, to Hoechst Aktiengesellschaft. Process for the preparation of fluorine-containing ketones. 4,136,121, Cl. 260-593.00H.

Marvin M. Stark Research Foundation: *See—*
Stark, Marvin M., 4,135,528, Cl. 132-89.000.

Maryanoff, Bruce E., to McNeil Laboratories, Inc. Process and promoting agents for the preparation of loweralkyl 2-(N-R'-pyrryl)-alpha-loweralkanoic acid esters. 4,136,097, Cl. 260-326.200.

Masaaki, Shinohara: *See—*
Seike, Yajuro; Matsuo, Yoshikuni; Nakashima, Masaru; Shojima, Toshikazu; and Masaaki, Shinohara, 4,136,030, Cl. 210-242.00S.

Mascia, Carmen T.; and Hasagawa, Gary K., to Continental Group, Inc., The. Motor driven dispensing unit for containers. 4,135,647, Cl. 222-211.000.

Massachusetts Institute of Technology: *See—*
Ezekiel, Shaoul, 4,135,822, Cl. 356-350.000.

Massey-Ferguson Inc.: *See—*
Lorenz, Leo J.; and Asztalos, Auguste, 4,135,731, Cl. 280-461.00A.
Smith, Alfred R.; and Segales, Jaime, 4,135,757, Cl. 296-35.00R.

Massey-Ferguson Services N.V.: *See—*
Hausmann, Winfried, 4,135,756, Cl. 296-28.00J.

Massoubre, Jean-Maire, to Compagnie Generale des Etablissements Michelin. Continuous solution polymerization process. 4,136,244, Cl. 526-174.000.

Massoubre, Jean-Marie, to Compagnie Generale des Etablissements Michelin. Continuous solution polymerization process. 4,136,245, Cl. 526-174.000.

Masuda, Hiromasa: *See—*
Nomura, Yukio; Nagura, Osamu; and Masuda, Hiromasa, 4,136,068, Cl. 260-15.000.

Masunaga, Makoto; Hosoe, Kazuya; Tsunekawa, Tokuichi; Tamura, Shuichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Range finding device. 4,135,815, Cl. 356-4.000.

Matherne, Michael M. Welding ladder with folding and sliding rungs. 4,135,605, Cl. 182-194.000.

Matranga, Eve; and Hokama, Yosh, to International Beauty Distributor. Application of fingernal extension to natural fingernail. 4,135,526, Cl. 132-73.000.

Matson, Crawford A.: *See—*
Ragard, Phillip A.; and Matson, Crawford A., 4,135,558, Cl. 140-105.000.

Matsui, Goro: *See—*
Horiishi, Nanao; Takedoi, Atushi; Kondo, Hiroyuki; Sumita, Hiroshi; Mukaizaka, Akira; and Matsui, Goro, 4,136,049, Cl. 252-62.560.

Matsumoto, Genichi: *See—*
Okumura, Yoshio; Matsumoto, Genichi; Tachibana, Kyozo; and Nozaki, Yoshio, 4,136,305, Cl. 318-376.000.

Matsuo, Yoshikuni: *See—*
Seike, Yajuro; Matsuo, Yoshikuni; Nakashima, Masaru; Shojima, Toshikazu; and Masaaki, Shinohara, 4,136,030, Cl. 210-242.00S.

Matsushita Electric Industrial Co., Ltd.: *See—*
Tanaka, Junzo; and Urashima, Chikao, 4,136,271, Cl. 219-10.55F.

Matsushita Electronics Corporation: *See—*
Hosokoshi, Kakuichiro; Nakamura, Hiroto; Sato, Akira; and Maeda, Masakazu, 4,135,930, Cl. 96-36.100.
Mizukoshi, Kanji; and Hagio, Goryo, 4,136,355, Cl. 357-46.000.

Matsuura, Kazuo: *See—*
Ikuta, Shigeru; Horiuchi, Yoshifumi; Misaki, Hideo; Matsuura, Kazuo; Imamura, Shigeyuki; and Muto, Naoki, 4,135,980, Cl. 195-62.000.

Mattel, Inc.: *See—*
Kimmell, Steven D., 4,135,645, Cl. 222-83.000.
Sapkus, Jurgis; and Lewis, J. Stephen, 4,135,327, Cl. 46-161.000.
Yamasaki, Toshio, 4,135,328, Cl. 46-202.000.

Mattern, Konrad, to Ekono Oy. Method of evaporating and/or concentrating water-containing liquids. 4,135,567, Cl. 159-165.000.

Matthew, Ian G.; Pickering, Ralph W.; Suzuki, Takashi; and Uchida, Hisashi, to Electrolytic Zinc Company of Australia Limited; and Mitsubishi Metal Corporation. Electric smelting of lead sulphate residues. 4,135,912, Cl. 75-10.00R.

Matthew, John B.: *See—*
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., 4,136,018, Cl. 209-13.000.

Matthews, Thomas A., to B. T. Crump Company, Inc. Fastening device for releasably or non-releasably fastening parts of a halter to each other. 4,135,348, Cl. 54-24.000.

Matunaga, Sigetugu: *See—*
Manabe, Takao; Machi, Shinji; and Matunaga, Sigetugu, 4,135,459, Cl. 112-121.120.

Maucher, Walter H. Apparatus for reducing fiber material to chip form. 4,135,563, Cl. 144-323.000.

Maurer, Fritz; Fuchs, Reiner A.; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. O-alkyl-O-[6-substituted-thio-pyridazin-3-yl]-(thiono) (thiol)-phosphoric (phosphonic) acid esters. 4,136,176, Cl. 424-200.000.

Maus, Dieter; and Buck, Hermann, to Bielomatik Leuze & Co. Devices for severing strips. 4,135,420, Cl. 83-371.000.

Mausbach, Karl Heinz, to 2 A S.p.A. Method of fastening a spiral element to a fabric tape for a sliding-clamp fastener. 4,135,555, Cl. 139-384.00B.

Mausner, Jack J.: *See—*
Barnett, Gabriel; Gershaw, Nathan; and Mausner, Jack J., 4,136,166, Cl. 424-62.000.

Maxwell, William H.; and Sines, Harvey J., to Time & Temperature Company. Electronic thermograph. 4,135,400, Cl. 73-343.500.

Mayes, Barry J. R.: *See—*
Hughes, Allan R.; McCrudden, Joseph E.; and Mayes, Barry J. R., 4,136,204, Cl. 426-261.000.

Mayne, John E. O.; and Heyes, Peter J., to National Research Development Corporation. Metal coating compositions. 4,135,934, Cl. 106-14.360.

Mazanek, Jan; and Blahak, Johannes, to Bayer Aktiengesellschaft. Process for the preparation of polymers containing amino groups and hydroxyl and/or mercapto groups. 4,136,091, Cl. 260-455.00R.

Mazzeo, Michael P.: *See—*
Jackle, William A.; Mazzeo, Michael P.; and Gillis, Marina N., 4,136,092, Cl. 528-60.000.

Mazzola, Louis R., to Lever Brothers Company. Encapsulated bleaches and methods for their preparation. 4,136,052, Cl. 252-94.000.

McCall, Francis L., to Specified Ceiling Systems. Integrated air diffuser. 4,135,441, Cl. 98-40.00D.

McConnell, Richard L.: *See—*
Vachon, Raymond N.; and McConnell, Richard L., 4,136,069, Cl. 260-23.0AR.

McCray, David M.; and Gulibon, Robert S., to Kennametal Inc. Clamping device. 4,135,418, Cl. 82-36.00A.

McCreary, Michael D.: *See—*
Fernandez, Jose M.; McCreary, Michael D.; Ross, Robert E.; and Staples, Jon T., 4,135,929, Cl. 96-29.00D.

McCrudden, Joseph E.: *See—*
Hughes, Allan R.; McCrudden, Joseph E.; and Mayes, Barry J. R., 4,136,204, Cl. 426-261.000.

McCullough, Harold E., to Bell Telephone Laboratories, Incorporated. Electrically heated anchor insertion tool. 4,136,275, Cl. 219-230.000.

McDonald, John O.: *See—*
Eang, Tan H.; McDonald, John O.; and Yi, Kenneth C., 4,135,560, Cl. 141-198.000.

McDonnell, Francis M.: *See—*
Chan, Robert H. G.; Mann, Martin R.; and McDonnell, Francis M., 4,136,399, Cl. 364-900.000.

McGee, George L. Device for making body measurements of a patient or the like. 4,135,498, Cl. 128-2.00S.

McGuire, Dennis P., to Lord Corporation. Rotor blade retention system. 4,135,856, Cl. 416-134.00A.

McInerney, James. Operator balanced, manually powered crane. 4,135,627, Cl. 212-8.00R.

McKee, Harry A. Miniaturized model kitchen having coordinated interchangeable and integratable modules. 4,135,315, Cl. 35-16.000.

McKinney, Kenneth D., Jr.: *See—*
McKinney, Kenneth D., Sr.; and McKinney, Kenneth D., Jr., 4,135,267, Cl. 7-151.000.

McKinney, Kenneth D., Sr.; and McKinney, Kenneth D., Jr. Utility belt buckle. 4,135,267, Cl. 7-151.000.

McKinnon, Eugene T.: *See—*
Wooldridge, Darrel; and McKinnon, Eugene T., 4,135,471, Cl. 116-366.000.

McLafferty, George H., to United Technologies Corporation. Unstable ring resonator with cylindrical mirrors. 4,135,787, Cl. 350-294.000.

McMennamy, John A.: *See—*
Nafziger, Marvin L.; and McMennamy, John A., 4,135,442, Cl. 99-582.000.

McMurtry, Carl H.: *See—*
Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., 4,135,937, Cl. 106-44.000.
Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., 4,135,938, Cl. 106-44.000.

McNally Mountain States Steel Company: *See—*
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Suttles, James M., 4,135,837, Cl. 403-245.000.

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Reich, Sanford; and Gates, William H., 4,135,253, Cl. 3-1.700.

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Harkness, Jack W.; and Mefford, Maurice P., 4,135,882, Cl. 422-133.000.

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Kahan, Jean S.; and Kahan, Frederick M., 4,135,978, Cl. 195-29.000.

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Meyer, Raymond J.; Johnson, Wayne F.; and Wodehouse, Richard A., to Aluminum Company of America. Caustic solution having controlled dissolved aluminum content. 4,136,026, Cl. 210-45.000.

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Kamm, Gerard R.; Milks, David; Kearns, James D.; Britt, Herbert I.; and Khavarian, Cyrus R., 4,136,015, Cl. 208-129.000.

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Miner, Earl L., to Detroit Tool & Engineering Co. Portable carwash apparatus. 4,135,270, Cl. 15-53.00A.

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Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

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Frank, John W.; and Lucking, Lawrence M., 4,135,813, Cl. 355-71.000.
Hannula, Rodney R., 4,135,637, Cl. 220-271.000.
Jonnes, Nelson, 4,136,222, Cl. 428-116.000.
Reale, Richard C., 4,135,517, Cl. 128-303.00R.

Misaki, Hideo: *See—*
Ikuta, Shigeru; Horiuchi, Yoshifumi; Misaki, Hideo; Matsuura, Kazuo; Imamura, Shigeyuki; and Muto, Naoki, 4,135,980, Cl. 195-62.000.

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Latina, Roland N.; and Mitchell, Hal D., 4,135,252, Cl. 2-2.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Nagai, Nobuo; Watanabe, Tugio; and Tada, Shoji, 4,136,299, Cl. 313-325.000.
Saito, Masato; Watanabe, Keiji; and Fukuyama, Keiji, 4,136,227, Cl. 428-389.000.
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,136,333, Cl. 340-147.00C.

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Seike, Yajuro; Matsuo, Yoshikuni; Nakashima, Masaru; Shojima, Toshikazu; and Masaaki, Shinohara, 4,136,030, Cl. 210-242.00S.

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Matthew, Ian G.; Pickering, Ralph W.; Suzuki, Takashi; and Uchida, Hisashi, 4,135,912, Cl. 75-10.00R.

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Ogiro, Kenji; Hashizume, Shin; Miyakawa, Seii; and Kishi, Masaya, 4,136,366, Cl. 360-96.000.

Miyatake, Hirokazu, to Kunimitsu Nagatoshi. Reaping machine for parsley. 4,135,350, Cl. 56-131.000.

Miyazaki, Kazuo: *See—*
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Miyazawa, Chiaki: *See—*
Hishida, Yukio; Asai, Yuichi; Kondo, Toshikatsu; Asai, Akira; Sakaida, Atsuo; and Miyazawa, Chiaki, 4,135,830, Cl. 400-124.000.

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Mitsutsuka, Norimasa; Kubo, Katsumi; and Miyazawa, Tatsuo, 4,135,970, Cl. 176-19.0LD.

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Mizukoshi, Kanji; and Hagio, Goryo, to Matsushita Electronics Corporation. Darlington transistor. 4,136,355, Cl. 357-46.000.

Mizuno Sporting Goods, Co., Ltd.: *See*—
Ikeda, Eizo, 4,135,317, Cl. 36-134.000.

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Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; Sasaki, Kanemichi; and Hasegawa, Kouji, 4,136,191, Cl. 424-279.000.

Mizushima, Eiji: *See*—
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, 4,135,903, Cl. 65-5.000.

Mobil Oil Corporation: *See*—
Braid, Milton, 4,136,044, Cl. 252-51.50A.
Haag, Werner O.; and Olson, David H., 4,136,128, Cl. 260-671.00R.
Whitehurst, Darrell D., 4,136,021, Cl. 208-251.00R.

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Moeller, Charles R., to Eastman Technology, Inc. Magnetic film sensor. 4,136,370, Cl. 360-111.000.

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Moestue, Hans J. Mechanism for cleaning a cylinder of an offset lithographic printing press. 4,135,448, Cl. 101-425.000.

Mohr, Paul; and Pokowitz, Wolf D., to Volkswagenwerk Aktiengesellschaft. Motor vehicle air-conditioning system. 4,135,368, Cl. 62-133.000.

Molins Limited: *See*—
Davies, Robert W.; and Wager, Leonard R., 4,135,617, Cl. 198-458.000.

Moll, Norman G.; and Quarderer, George J., to Dow Chemical Company, The. Emulsion catalyst for hydrogenation processes. 4,136,013, Cl. 208-10.000.

Moller, Hinrich; and Thimm, Hans-Joachim, to Henkel Kommanditgesellschaft auf Aktien. Cosmetic preparations with alkoxybenzoic acid esters as inflammation inhibitors and method. 4,136,165, Cl. 424-60.000.

Molochnikov, Viktor V.; Efimov, Vasily I.; Veraxo, Anatoly S.; and Savitsky, Evgeny M. Apparatus for measuring Q-quality of oscillatory circuit components. 4,136,313, Cl. 324-57.00R.

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Dahms, Ronald H., 4,136,228, Cl. 428-476.000.
Howe, Robert K., 4,135,910, Cl. 71-92.000.
Lee, Yoon C., 4,136,135, Cl. 260-874.000.
Stone, Bobbie B., 4,135,951, Cl. 148-1.500.

Monsanto Limited (Monsanto Chemicals Ltd.): *See*—
Worrall, Roy, 4,136,140, Cl. 264-42.000.

Montgomery, Lon W.: *See*—
Salon, Sheppard J.; and Montgomery, Lon W., 4,136,312, Cl. 324-51.000.

Montiel, Alexandra. Eyelash extender product and method of application. 4,135,527, Cl. 132-88.700.

Moody, Roy A.: *See*—
Caveney, Jack E.; and Moody, Roy A., 4,135,749, Cl. 292-317.000.

Mookherjee, Braja D.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
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Moon, Allen J.: *See*—
Bishop, Bruce J.; and Moon, Allen J., 4,135,878, Cl. 8-139.000.

Moore, Herbert E.: *See*—
Flanders, Thomas E.; and Moore, Herbert E., 4,136,327, Cl. 340-18.0FM.

Moran, George A.: *See*—
Fowler, James M.; and Moran, George A., 4,135,545, Cl. 137-246.220.

Moraw, Roland, to Hoechst Aktiengesellschaft. Apparatus for the repeated recording of deformation images on a recording material. 4,135,807, Cl. 355-9.000.

Morgan, Samuel A., to Sycor, Inc. Disc recorder with lead screw drive. 4,136,369, Cl. 360-106.000.

Mori, Chuzo, to Carl Manufacturing Co., Ltd. Indexing device. 4,135,319, Cl. 40-389.000.

Mori, Shuji, to University of Utah. Single stage, coal gasification reactor. 4,135,889, Cl. 48-73.000.

Moriarty, Maurice F. Ring cutting tool. 4,135,299, Cl. 30-182.000.

Morishita, Masataka; Fukushima, Mitsuru; and Inaba, Yoshihito, to Toyo Jozo Company, Ltd. Novel selective adsorbents. 4,135,943, Cl. 106-209.000.

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Uchida, Shinya; Moriyama, Sinai; and Yoshida, Minoru, 4,135,709, Cl. 271-95.000.

Morley, Roy D., to Caterpillar Tractor Co. Positioning apparatus for a track assembly machine. 4,135,360, Cl. 59-7.000.

Morozowich, Walter, to Upjohn Company, The. Inter-phenylene-PG carbonyl- or cyano-substituted amides. 4,136,115, Cl. 260-559.00R.

Morrell, Albert M., to RCA Corporation. Cathode ray tube having improved shadow mask. 4,136,300, Cl. 313-403.000.

Morrice, Edward; and Marchant, Jack D., to United States of America, Interior. Process for the preparation of rare-earth-silicon alloys. 4,135,921, Cl. 75-134.00N.

Morris, Joseph W.; and Marchese, Vincent P., to United States of America, Navy. Safing a flueric cartridge initiator. 4,135,454, Cl. 102-205.000.

Morrison, Bertram L., to ACF Industries, Incorporated. Stem packing assembly for gate valves and means for removal. 4,135,546, Cl. 137-315.000.

Morrison, Douglas I., to Pitney-Bowes, Inc. Document feeder for a copier. 4,135,808, Cl. 355-14.000.

Morse, Glenn B.: *See*—
Paulson, Rollie W.; and Morse, Glenn B., 4,135,722, Cl. 274-23.00A.

Moulin, Michele; Escher, Balint; Prince, Dominique; and Vasseux, Jean, to Societe Lignes Telegraphiques et Telephoniques. Surface treatment of the anodes for tantalum capacitors. 4,135,990, Cl. 204-32.00R.

Moutou, Paul C.; Gibeau, Pierre; and Duchemin, Jean-Pascal, to Thomson-CSF. Novel field-effect structures. 4,136,352, Cl. 357-22.000.

Mrozek, John W.: *See*—
Nagati, Rashed N.; Fisher, Howard M.; and Mrozek, John W., 4,135,703, Cl. 266-165.000.

Mucke, Walter: *See*—
Mieschke, Rudolf; and Mucke, Walter, 4,135,643, Cl. 222-47.000.

Mueller, Karl F.; and Kleiner, Eduard K., to Ciba-Geigy Corporation. Polysiloxane hydrogels. 4,136,250, Cl. 528-29.000.

Muhr, John A.: *See*—
Dugan, William P.; and Muhr, John A., 4,135,988, Cl. 204-15.000.

Mukaizaka, Akira: *See*—
Horiishi, Nanao; Takedoi, Atushi; Kondo, Hiroyuki; Sumita, Hiroshi; Mukaizaka, Akira; and Matsui, Goro, 4,136,049, Cl. 252-62.560.

Mulder, Willem; Bouman, Antonius F. M.; and Zwarts, Johan M. C., to Hollandse Signaalappareten, B.V. Radar system employing two kinds of pulses. 4,136,341, Cl. 343-17.2PC.

Muller, Anton; Konig, Hubert; and Magiera, Helmut, to Eisen- und Drahtwerk Erlau Aktiengesellschaft. Skid protection for vehicle tires. 4,135,564, Cl. 152-182.000.

Muller, George A.: *See*—
Forward, John E.; Muller, George A.; and Connolly, Douglas P., 4,135,642, Cl. 222-23.000.

Muller, Gunter, to ARENCO-BMD Maschinenfabrik GmbH. Foundry molding installation for producing boxless sand molds. 4,135,570, Cl. 164-182.000.

Muller, Leo K. M.: *See*—
Hench, Hans H. W.; and Muller, Leo K. M., 4,135,767, Cl. 302-31.000.

Mundt, Peter: *See*—
Urban, Otfried; Mundt, Peter; and Neuhold, Arnold, 4,135,343, Cl. 53-435.000.

Munger, Richard R., to MW Industries, Inc. Arrow vane and method for the preparation thereof. 4,136,144, Cl. 264-161.000.

Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Apparatus for manufacturing resin tubes alternately having a thick wall portion and a thin wall portion. 4,135,871, Cl. 425-377.000.

Murakami, Susumu: *See*—
Sugawara, Yoshitaka; Kamei, Tatsuya; Murakami, Susumu; Miyoshi, Tadahiko; and Ogawa, Takuzo, 4,136,351, Cl. 357-19.000.

Murao, Mikio: *See*—
Suzuki, Takeshi; Murao, Mikio; Utiyama, Susumu; Hatanaka, Kyohei; and Inoue, Hajime, 4,135,904, Cl. 65-27.000.

Murasugi, Keiji: *See*—
Shibata, Susumu; Nomoto, Tsutomu; and Murasugi, Keiji, 4,136,274, Cl. 219-216.000.

Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,136,320, Cl. 333-82.0BT.

Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., to Carborundum Company, The. High density hot pressed thermal shock resistant silicon carbide. 4,135,937, Cl. 106-44.000.

Murata, Yorihiro; Coppola, John A.; and McMurtry, Carl H., to Carborundum Company, The. High density thermal shock resistant sintered silicon carbide. 4,135,938, Cl. 106-44.000.

Muriot, Edward E., to Health Technology Laboratories, Inc. Medical/-surgical suction equipment. 4,135,515, Cl. 128-276.000.

Muro, Kakuro; Yashiro, Kuniji; Kaneko, Hideaki; and Yamazaki, Kiyoichi, to Oxy Metal Industries Corporation. Process for treating an aluminum surface. 4,136,073, Cl. 260-29.2EP.

Murphy, Robert E.; and Bernholdt, Harry F., to Swift & Company. Meat packaging. 4,136,203, Cl. 426-124.000.

Murphy, Thomas A.; Long, Richard E.; and Tebo, Kenneth L., to Entwistle Company, The. Means for controlling a wire discharged from a flyer payoff. 4,135,679, Cl. 242-128.000.

Murrah, Howard E., to Ex-Cell-O Corporation. Carton bottom breaker. 4,135,439, Cl. 93-36.800.

Murray, Henry A., II: *See*—
Miller, Ronald L.; and Murray, Henry A., II, 4,135,324, Cl. 46-74.00D.

Murray, Kenneth M., to United States of America, Navy. Energy fluence meter for X-rays. 4,136,281, Cl. 250-336.000.

Musgrave, Donald A.: *See*—
Allgeyer, David F.; Musgrave, Donald A.; and Reifeiss, Lester F., 4,135,369, Cl. 62-251.000.
Muto, Naoki: *See*—
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MW Industries, Inc.: *See*—
Munger, Richard R., 4,136,144, Cl. 264-161.000.
Nadelson, Jeffrey, to Sandoz, Inc. 2-Aminomethylene-5-hydroxy-N-alkyl-3-oxo-amides. 4,136,114, Cl. 260-559.00A.
Nafziger, Marvin L.; and McMennamy, John A., to Sunnyland Farms, Inc. Nut cracking machine. 4,135,442, Cl. 99-582.000.
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, to Schering Corporation. Process of selectively blocking amino functions in aminoglycosides using transition metal salts and intermediates used thereby. 4,136,254, Cl. 536-10.000.
Nagai, Nobuo; Watanabe, Tugio; and Tada, Shoji, to Mitsubishi Denki Kabushiki Kaisha. Lightning arrester device. 4,136,299, Cl. 313-325.000.
Nagaoka, Mitsuo: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,135,876, Cl. 432-14.000.
Nagati, Rashed N.; Fisher, Howard M.; and Mrozek, John W., to Pennsylvania Engineering Corporation. Mobile hot metal mixer. 4,135,703, Cl. 266-165.000.
Nagel, Arthur A., to Pfizer Inc. Semi-synthetic 4''-sulfonylamino-oleandomycin derivatives. 4,136,253, Cl. 536-9.000.
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Kennedy, Melvin, 4,135,329, Cl. 46-206.000.
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Nomura, Yukio; Nagura, Osamu; and Masuda, Hiromasa, 4,136,068, Cl. 260-15.000.
Naiman, Charles S.: *See*—
Chicklis, Evan P.; and Naiman, Charles S., 4,136,316, Cl. 331-94.50F.
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Tanaka, Yasuyuki; and Nakajima, Kazuo, 4,135,964, Cl. 156-661.000.
Nakamoto, Yakayuki, to Iwata Electric Works, Ltd. Tool for mounting retaining rings on a shaft. 4,135,284, Cl. 29-229.000.
Nakamura, Hiroto: *See*—
Hosokoshi, Kakuichiro; Nakamura, Hiroto; Sato, Akira; and Maeda, Masakazu, 4,135,930, Cl. 96-36.100.
Nakamura, Hiroyuki: *See*—
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Nakamura, Ken: *See*—
Abe, Tadashi; Horiuchi, Tatumi; Nakamura, Ken; Ohyama, Yoshio; and Kurihara, Shigeatsu, 4,135,806, Cl. 355-8.000.
Nakamura, Nobuyuki: *See*—
Horikoshi, Koki; and Nakamura, Nobuyuki, 4,135,977, Cl. 195-7.000.
Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Col., Ltd. Variable venturi type carburetor. 4,136,139, Cl. 261-44.00C.
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for simultaneously calcining first kind of pulverized materials containing combustible compounds and second kind of pulverized materials. 4,135,876, Cl. 432-14.000.
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Eujita, Haruo; Ishikawa, Yasushi; Tachikawa, Hiroshi; and Nakamura, Taizo, 4,136,273, Cl. 219-121.00P.
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Umemoto, Tomoji; and Nakamura, Yukichi, 4,135,843, Cl. 405-18.000.
Nakao, Toshihiro; and Saito, Kazumi, to Olympus Optical Co., Ltd. Miniature receiving set with a pivotable stand. 4,136,344, Cl. 343-702.000.
Nakashima, Masaru: *See*—
Seike, Yajuro; Matsuo, Yoshikuni; Nakashima, Masaru; Shojima, Toshikazu; and Masaaki, Shinohara, 4,136,030, Cl. 210-242.00S.
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Cosper, David R., 4,135,969, Cl. 162-167.000.
Naruse, Yohsuke; Yamamoto, Masanobu; and Sugiki, Mikio, to Sony Corporation. Optical video playback apparatus with tracking control and TBC. 4,136,362, Cl. 358-128.000.
National Car Rental System, Inc.: *See*—
Covington, William P., 4,135,279, Cl. 27-4.000.
National Patent Development Corporation: *See*—
Kronman, Joseph H.; and Goldman, Melvin, 4,135,302, Cl. 32-57.000.
National Railroad Passenger Corporation: *See*—
Gall, Herbert J.; and Noonan, Robert T., 4,135,533, Cl. 134-104.000.
National Research Development Corporation: *See*—
Day, William H., 4,135,505, Cl. 128-92.00A.
Mayne, John E. O.; and Heyes, Peter J., 4,135,934, Cl. 106-14.360.
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Dobkin, Robert C., 4,136,354, Cl. 357-36.000.
Frederiksen, Thomas M., 4,136,357, Cl. 357-72.000.
Ross, John P.; and Bernardi, Carl E., 4,135,557, Cl. 140-105.000.
Naucler, Bengt O.: *See*—
Jansson, Eric O.; Naucler, Bengt O.; and Asberg, Thomas, 4,135,853, Cl. 415-204.000.
Naudot, Jean-Claude; and Cholez, Roger, to Societe d'Etudes, Recherches et Construction Electroniques (Sercel). Apparatus for obtaining seismic data. 4,136,326, Cl. 340-15.5DP.
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Hsieh, Henry L.; and Naylor, Floyd E., 4,136,137, Cl. 260-880.00B.
Nealy, Robert H. Integrated sewage treatment system. 4,135,665, Cl. 237-8.00R.
Nedelec, Lucien; Torelli, Vesperto; and Fournex, Robert, to Roussel Uclaf. 2,2-Dimethyl-19-nor-steroids. 4,136,179, Cl. 424-242.000.
Neff, Edward C.; and Spicer, Howard F., to Westinghouse Electric Corp. Finned tube coil and method of making same. 4,135,282, Cl. 29-157.30A.
Nelson, Paul M.; and Hutchinson, Carl P., to Wilson Industries, Inc. Tool centralizer guide having a J-groove release. 4,135,577, Cl. 166-241.000.
Nemecek, Oldrich: *See*—
Fisnerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, 4,136,194, Cl. 424-274.000.
Neos, Gus: *See*—
Schalge, Roger D.; and Neos, Gus, 4,135,432, Cl. 85-84.000.
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Cosack, Klaus; Hein, Wolfgang; and Neumann, Manfred, 4,136,029, Cl. 210-242.00R.
Neville, Mark H.; and Taylor, Thomas S., to International Business Machines Corporation. Object deflection sensor. 4,136,345, Cl. 346-75.000.
New England Nuclear Corporation: *See*—
Stone, Marcia J., 4,136,159, Cl. 424-1.000.
NHK Spring Co., Ltd.: *See*—
Katayama, Shitomi; Koyama, Nobuaki; Shimabukuro, Hajime; and Jin, Kiyoshi, 4,136,079, Cl. 260-37.00N.
Nichols, Clarence M.: *See*—
Tlaker, Erich; and Nichols, Clarence M., 4,136,302, Cl. 318-39.000.
Nidola, Antonio: *See*—
de Nora, Vittorio; Nidola, Antonio; and Spaziante, Placido M., 4,136,235, Cl. 429-204.000.
Niemann, Ernst-Georg; Christoffers, Dirk; and Georgi, Bernd, to Gesellschaft fur Strahlen- und Umweltforschung mbH. Method and apparatus for determining the total protein content or individual amino acids. 4,135,816, Cl. 356-317.000.
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Nikkel, Ronnie D., to Phillips Petroleum Company. Method for start up of a yarn crimping process. 4,135,511, Cl. 28-221.000.
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Almquist, Hans; Nilsson, Lars-Olof; and Skoog, Hans, 4,136,303, Cl. 318-52.000.
Ninneman, Lawrence D., to Owens-Illinois, Inc. Method for forming tubular plastic articles. 4,136,146, Cl. 264-237.000.
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Chibana, Masanobu, 4,135,422, Cl. 84-1.010.
Hayashida, Hajime, 4,135,430, Cl. 84-254.000.
Okamoto, Shimaji, 4,135,424, Cl. 84-1.130.
Nippon Kayaku Kabushiki Kaisha: *See*—
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; Sasaki, Kanemichi; and Hasegawa, Kouji, 4,136,191, Cl. 424-279.000.
Nippon Kogaku K.K.: *See*—
Takahashi, Youske; and Akasaka, Hideki, 4,135,790, Cl. 350-357.000.
Nippon Light Metal Company Limited: *See*—
Ishikawa, Tatsuo; and Ichikawa, Hachiro, 4,135,994, Cl. 204-67.000.
Nippon Mektron Kabushiki Kaisha: *See*—
Tanaka, Yasuyuki; and Nakajima, Kazuo, 4,135,964, Cl. 156-661.000.
Nippon Oil Co., Ltd.: *See*—
Kaiya, Atsushi; Arai, Eizo; Kawaguchi, Hideo; and Miyazaki, Kazuo, 4,136,088, Cl. 260-669.00P.
Nippon Oil and Fats Company, Limited: *See*—
Nomura, Yukio; Nagura, Osamu; and Masuda, Hiromasa, 4,136,068, Cl. 260-15.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, 4,135,903, Cl. 65-5.000.
Nippon Soken, Inc.: *See*—
Wakamatsu, Hisato; and Yazawa, Akio, 4,135,402, Cl. 73-361.000.
Nippon Steel Corporation: *See*—
Eujita, Haruo; Ishikawa, Yasushi; Tachikawa, Hiroshi; and Nakamura, Taizo, 4,136,273, Cl. 219-121.00P.
Nippon Telegraph and Telephone Public Corporation: *See*—
Takesue, Masaru, 4,136,383, Cl. 364-200.000.
Nippondenso Co., Ltd.: *See*—
Nojiri, Tadao; and Sugiura, Akio, 4,135,663, Cl. 235-463.000.
Wakamatsu, Hisato; and Yazawa, Akio, 4,135,402, Cl. 73-361.000.
Nischwitz, Ehrenfried; Holst, Arno; Smerz, Ottokar; Kostrzewa, Michael; and Lask, Helmut, to Hoechst Aktiengesellschaft. Process for

the improvement of the water-absorbing capacity and the absorptivity of textile materials. 4,136,218, Cl. 427-339.000.
Nishikawa, Masaji; Sato, Eiichi; and Yanagisawa, Kazuhisa, to Olympus Optical Company Limited. Electrophotographic apparatus. 4,135,811, Cl. 355-3.0SC.
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Method of constructing dielectric resonator unit and dielectric resonator unit produced thereby. 4,136,320, Cl. 333-82.0BT.
Noguchi, Akinori; Kimura, Susumu; and Umeda, Keiji, to Director of National Food Research Institute. Process for production of textural protein food material from krills. 4,136,210, Cl. 426-657.000.
Nojiri, Tadao; and Sugiura, Akio, to Nippondenso Co., Ltd. System for recognizing bar code information. 4,135,663, Cl. 235-463.000.
Nomoto, Tsutomu: *See—*
Shibata, Susumu; Nomoto, Tsutomu; and Murasugi, Keiji, 4,136,274, Cl. 219-216.000.
Nomura, Katsuhiko: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Nomura, Katsuhiko, 4,135,795, Cl. 354-23.00D.
Nomura, Yukio; Nagura, Osamu; and Masuda, Hiromasa, to Nippon Oil and Fats Company, Limited. Cellulose ester graft polymer/acrylic co-polymer/amino resin water dispersible coating composition. 4,136,068, Cl. 260-15.000.
Noonan, Robert T.: *See—*
Gall, Herbert J.; and Noonan, Robert T., 4,135,533, Cl. 134-104.000.
Norlin Music, Inc.: *See—*
Gross, Glenn M., 4,135,423, Cl. 84-1.030.
Norris Industries, Inc.: *See—*
Lockwood, Alan C.; and Stock, Glenn A., 4,135,633, Cl. 220-3.940.
North American Products Corp.: *See—*
Bertram, James T.; Segal, Steven A.; and Segal, Arthur R., 4,135,421, Cl. 83-835.000.
Nothacker, Siegfried: *See—*
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Nothdurft, Jurgen: *See—*
Bauer, Udo; Nothdurft, Jurgen; and Langer, Willi, 4,136,141, Cl. 264-45.200.
November, Milton H., to International Telephone and Telegraph Corporation. Vibration densitometer probe. 4,135,383, Cl. 73-32.00A.
Novikov, Nikolai A.: *See—*
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Novo Laboratories, Incorporated: *See—*
Spina, Joseph; and Weibel, Michael K., 4,135,516, Cl. 128-303.00R.
Nowakowski, James J. Inside-outside deburring tool and optional flycutter. 4,135,846, Cl. 408-183.000.
Nozaki, Michio B., to Rheem Manufacturing Company. Non-sacrificial anode and water heater construction. 4,136,001, Cl. 204-196.000.
Nozaki, Yoshio: *See—*
Okumura, Yoshio; Matsumoto, Genichi; Tachibana, Kyozo; and Nozaki, Yoshio, 4,136,305, Cl. 318-376.000.
Nuclear Supreme: *See—*
Waltrip, Owen R., 4,135,888, Cl. 44-1.00D.
Nunn, Bruce E.: *See—*
Clark, Llewellyn E.; Matthew, John B.; and Nunn, Bruce E., 4,136,018, Cl. 209-13.000.
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Filippini, Umberto; and Bianchini, Pierluigi, 4,135,661, Cl. 235-132.00R.
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.
Oak, Reginald O. Protective boot for a high voltage circuit interrupter. 4,136,372, Cl. 361-131.000.
Occidental Chemical Company: *See—*
Mills, Harold E., 4,136,199, Cl. 423-321.00R.
Occidental Petroleum Corporation: *See—*
Green, Norman W., 4,135,982, Cl. 201-12.000.
Oce-van der Grinten N.V.: *See—*
Bomers, Johannes P., 4,135,475, Cl. 118-249.000.
Ochii, Kiyofumi: *See—*
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,136,292, Cl. 307-355.000.
Odam, Norman E.; and Costemalle, Bernard. Method of applying polyurethane paint to vulcanized rubber. 4,136,219, Cl. 427-385.00B.
Oehrle, Robert C., to Western Electric Co., Inc. Method and apparatus for drawing optical fibers. 4,135,902, Cl. 65-2.000.
Oelke, Waldemar W.: *See—*
Gladieux, Norman K.; Herrington, Richard A.; and Oelke, Waldemar W., 4,135,906, Cl. 65-348.000.
Oellerich, Michael: *See—*
Haeckel, Rainer; Oellerich, Michael; Heerdt, Ruth; Hubner, Manfred; and Kuhnle, Hans, 4,136,196, Cl. 424-319.000.
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Oertle, Donald H.: *See—*
Peterson, Marvin L.; and Oertle, Donald H., 4,135,386, Cl. 73-40.000.
Ogawa, Takuzo: *See—*
Sugawara, Yoshitaka; Kamei, Tatsuya; Murakami, Susumu; Miyoshi, Tadahiko; and Ogawa, Takuzo, 4,136,351, Cl. 357-19.000.
Ogi, Kenji; and Sakamoto, Masakatsu, to Trio Kabushiki Kaisha. Loudspeaker system. 4,135,600, Cl. 181-156.000.
Ogiro, Kenji; Hashizume, Shin; Miyakawa, Seii; and Kishi, Masaya, to Hitachi, Ltd. Cassette tape recorder and method for producing the same. 4,136,366, Cl. 360-96.000.
Ogiro, Kenji: *See—*
Ichikawa, Hisashi; and Ogiro, Kenji, 4,135,413, Cl. 74-529.000.
Oguchi, Masao: *See—*
Aikawa, Akira; Oguchi, Masao; Takeda, Toshihide; Kisaichi, Akio; and Saito, Toshio, 4,135,877, Cl. 8-115.500.
Oguri, Tuneji: *See—*
Fukuyo, Junji; Kanbe, Chiharu; Ohike, Yasuaki; and Oguri, Tuneji, 4,135,405, Cl. 73-499.000.
O'Halloran, William J.; and Trombley, James, Jr., to Woodward Governor Company. Isolated electrical power generation system with multiple isochronous, load-sharing engine-generator units. 4,136,286, Cl. 307-57.000.
Ohike, Yasuaki: *See—*
Fukuyo, Junji; Kanbe, Chiharu; Ohike, Yasuaki; and Oguri, Tuneji, 4,135,405, Cl. 73-499.000.
Ohmura, Hiroshi; and Shirane, Hideto, to Fuji Photo Film Co., Ltd. Shutter lock means for cameras. 4,135,797, Cl. 354-128.000.
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, to Nippon Sheet Glass Co., Ltd. Method for producing fibers from heat-softening materials. 4,135,903, Cl. 65-5.000.
Ohta, Masafumi: *See—*
Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, 4,135,928, Cl. 96-1.50R.
Ohyama, Yoshio: *See—*
Abe, Tadashi; Horiuchi, Tatumi; Nakamura, Ken; Ohyama, Yoshio; and Kurihara, Shigeatsu, 4,135,806, Cl. 355-8.000.
Okada, Masakazu; Ide, Jushi; Yasumoto, Seiichi; and Fushimi, Hitoshi, to Hitachi, Ltd. Loop type data highway system. 4,136,384, Cl. 364-200.000.
Okamoto, Miyoshi; and Yoshida, Syusuke, to Toray Industries, Inc. Suede-like raised woven fabric and process for the preparation thereof. 4,136,221, Cl. 428-91.000.
Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha. Variable function generator. 4,135,424, Cl. 84-1.130.
Oki Electric Industry Co., Ltd.: *See—*
Shibata, Susumu; Nomoto, Tsutomu; and Murasugi, Keiji, 4,136,274, Cl. 219-216.000.
Okuda, Yosiro; Horiishi, Nanao; Sumita, Hiroshi; and Harada, Tosiharu, to Toda Kogyo Corp. Production of acicular magnetic iron oxides. 4,136,158, Cl. 423-632.000.
Okumura, Yoshio; Matsumoto, Genichi; Tachibana, Kyozo; and Nozaki, Yoshio, to Hitachi, Ltd. Power converter control apparatus. 4,136,305, Cl. 318-376.000.
Olabisi, Olagoke, to Union Carbide Corporation. Process for the molding of plastic structural web and the resulting articles. 4,136,220, Cl. 428-35.000.
Oliver, Donald W., to Dresser Industries, Inc. Method and apparatus for pulsed neutron spectral analysis using spectral stripping. 4,136,278, Cl. 250-269.000.
Ollerer, Friedrich: *See—*
Theurer, Josef; and Ollerer, Friedrich, 4,135,631, Cl. 214-38.0CA.
Olson, David H.: *See—*
Haag, Werner O.; and Olson, David H., 4,136,128, Cl. 260-671.00R.
Olszewski, Egon; and Hanert, Eckehard, to Benteler-Werke AG. Method of and an apparatus for manufacturing elongated curved tubular elements. 4,135,380, Cl. 72-306.000.
Olympus Optical Co., Ltd.: *See—*
Fujimori, Ryo, 4,136,007, Cl. 204-299.00R.
Nakao, Toshihiro; and Saito, Kazumi, 4,136,344, Cl. 343-702.000.
Nishikawa, Masaji; Sato, Eiichi; and Yanagisawa, Kazuhisa, 4,135,811, Cl. 355-3.0SC.
Saito, Shoichi, 4,135,316, Cl. 35-35.00A.
O'Neill, Charles E.: *See—*
Ettel, Victor A.; Devuyst, Eric A. P.; Sridhar, Ramamritham; and O'Neill, Charles E., 4,135,918, Cl. 75-117.000.
Ono, Hiroshi. Aquatic vehicle. 4,135,470, Cl. 115-70.000.
Ono, Shin-etu: *See—*
Ishikawa, Fumiyoshi; Kosasayama, Akira; Watanabe, Yoshifumi; Abiko, Yasushi; Kameda, Kin-Ya; and Ono, Shin-etu, 4,136,188, Cl. 424-273.00R.
Onoe, Katuhiko; and Tanaka, Takashi, to Glory Kogyo Kabushiki Kaisha. Coin classification device in coin processing machine. 4,135,529, Cl. 133-3.00C.
Orain, Roger: *See—*
Bourelier, Claude; Orain, Roger; Pelzer, Rudolf; Schaefer, Wolfgang; and Schindler, Siegfried, 4,136,214, Cl. 427-169.000.
O'Rear, Jacques G.: *See—*
Griffith, James R.; and O'Rear, Jacques G., 4,136,107, Cl. 260-465.00E.
Orr, Clyde, Jr., to Georgia Tech Research Institute. Method and apparatus for automatically fractionating a sample of particulate material into discrete size fractions. 4,135,388, Cl. 73-61.400.
Ortho Diagnostics, Inc.: *See—*
Falkowski, Frank J.; and Wilson, Leonard T., 4,136,161, Cl. 424-3.000.

Osaka Gas Company Limited: *See*—
Sakamoto, Yusuke; Kinugasa, Munetaka; Endo, Shigeki; Yamane, Mituo; and Fujie, Shigeyoshi, 4,136,027, Cl. 210-63.00Z.

Ostapenko, Tatyana D.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Oswald, Alexis A., to Exxon Research & Engineering Co. Substituted tetraalkyl phosphonium aluminosilicates. 4,136,103, Cl. 260-448.00C.

Oswald, Hendrikus J.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,135,280, Cl. 28-257.000.

Ovation Instruments, Inc.: *See*—
Rickard, James H., 4,135,426, Cl. 84-1.160.

Overbey, Charles A. Dual flush devices for toilets. 4,135,262, Cl. 4-325.000.

Owens-Corning Fiberglas Corporation: *See*—
Eisenberg, Arnold J., 4,135,353, Cl. 57-22.000.

Owens-Illinois, Inc.: *See*—
Ninneman, Lawrence D., 4,136,146, Cl. 264-237.000.

Oxy Metal Industries Corporation: *See*—
Muro, Kakuro; Yashiro, Kuniji; Kaneko, Hideaki; and Yamazaki, Kiyoichi, 4,136,073, Cl. 260-29.2EP.

Oy Wartsila AB: *See*—
Rimppi, Martti; and Turunen, Olavi, 4,135,469, Cl. 114-270.000.

P.F.W. Beheer B.V.: *See*—
De Haan, Douwe R.; and Kettenes, Dirk K., 4,136,066, Cl. 252-522.000.

Pacetti, Clarence N. Caulking gun. 4,135,644, Cl. 222-81.000.

Packman, Allan B., to United Technologies Corporation. Device to provide flow inversion in a turbofan exhaust tailpipe to achieve low jet noise. 4,135,363, Cl. 60-262.000.

Panduit Corp.: *See*—
Caveney, Jack E.; and Moody, Roy A., 4,135,749, Cl. 292-317.000.

Pang, Steven J.: *See*—
Jones, Joseph; Pang, Steven J.; and Woodard, Roland L., Jr., 4,136,394, Cl. 364-561.000.

Pannone, John L.; and Smakula, Fritz K., to United Technologies Corporation. Reduced drag airfoil platforms. 4,135,857, Cl. 416-193.00A.

Parcor: *See*—
Frehel, Daniel; and Maffrand, Jean-Pierre, 4,136,186, Cl. 424-256.000.

Parish, Harold C.; Spulgis, Ivars S.; Hickey, Thomas N.; and Hoy, David R., to CVI Corporation. Gas purifier having rechargeable adsorber filter with removeable rechargeable sample canister. 4,135,896, Cl. 55-270.000.

Parkinson, Truman D., to Gould Inc. Recorder pen with ink jet writing device. 4,136,346, Cl. 346-140.00R.

Parry, Stephen H.; and Porter, Philip, to Internationale Octrooi Maatschappij "Octropa" B.V. Process for reducing the incidence of neonatal diarrhoea in pigs. 4,136,167, Cl. 424-87.000.

Pasquer, Loic: *See*—
Knapp-Ziller, Michel; and Pasquer, Loic, 4,136,288, Cl. 307-240.000.

Patel, Mahesh S., to Eutectic Corporation. Wear resistant alloy coating containing tungsten carbide. 4,136,230, Cl. 428-564.000.

Patel, Tulsidas R., to International Business Machines Corporation. Multi-actuator system using single magnetic circuit. 4,136,293, Cl. 310-13.000.

Patterson, John F.: *See*—
Garkisch, Hans D.; Yant, Howard W.; and Patterson, John F., 4,135,974, Cl. 176-87.000.

Patton, Henry W. J., to Raymond Lee Organization, Inc. Combination boot slip and jack. 4,135,652, Cl. 223-116.000.

Paulson, Rollie W.; and Morse, Glenn B., to Paulson, Rollie W. Record-cutting system. 4,135,722, Cl. 274-23.00A.

Pawlitschek, Donald P. Slatted floor system. 4,135,339, Cl. 52-660.000.

Payne, Roger A., to Gates Rubber Company, The. Molded rubber article and method. 4,136,149, Cl. 264-300.000.

Pechin, William H.; Thacker, Louis H.; and Turner, Lloyd J., to United States of America, Energy. Calibration of optical particle-size analyzer. 4,135,821, Cl. 356-335.000.

Peck, Donald. Stereoscopic patterns and method of making same. 4,135,502, Cl. 128-76.500.

Peck, Michael C.: *See*—
Finn, William M.; Peck, Michael C.; and Winstead, Maynard R., 4,136,075, Cl. 260-29.6TA.

Peikarov, Garegin A.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Peill, Peter G., to Rolls-Royce Limited. Hollow cooled blade or vane for a gas turbine engine. 4,135,855, Cl. 416-90.00R.

Pektin-Fabrik Hermann Herbstreith KG: *See*—
Fox, Gerhard, 4,136,209, Cl. 426-577.000.

Pellaton, Roy C., to Guntert & Pellaton, Inc.; and American Beauty Macaroni Company. Method and apparatus for stacking pasta strips. 4,135,616, Cl. 198-423.000.

Pellegrini, John P., Jr.; and Thayer, Helen I., to Gulf Research & Development Company. Lubricating oils containing dithiophosphorylated copolymers of aziridineethyl acrylates or methacrylates and alkyl acrylates or methacrylates. 4,136,042, Cl. 252-46.700.

Pelletier, Dennis C., to Hooker Chemicals & Plastics Corp. Preparation of bis(pentachlorocyclopentadienyl). 4,136,125, Cl. 260-648.00R.

Peltier, Raymond. Lightweight material comprising Portland cement, lime, sand, a colloid and an air entraining agent. 4,135,940, Cl. 106-88.000.

Pelzer, Rudolf: *See*—
Bourelier, Claude; Orain, Roger; Pelzer, Rudolf; Schaefer, Wolfgang; and Schindler, Siegfried, 4,136,214, Cl. 427-169.000.

Pennsylvania Engineering Corporation: *See*—
Nagati, Rashed N.; Fisher, Howard M.; and Mrozek, John W., 4,135,703, Cl. 266-165.000.

Pennwalt Corporation: *See*—
Sanchez, Jose, 4,136,105, Cl. 260-453.0RZ.

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Abe, Kiyomi; and Kameda, Hidetoshi, 4,136,336. Cl. 340-365.00S.

Penterman, Lou F.; and Geverink, Harry, to Assinck Bros. Limited. Portable radial stacker. 4,135,614, Cl. 198-306.000.

Penton, Jack I.: *See*—
Jaffe, James M.; and Penton, Jack I., 4,135,292, Cl. 29-578.000.

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Dean, Lee W., III; and Peracchio, Aldo A., 4,135,603, Cl. 181-286.000.

Peredereev, Alexandr V.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Perkin-Elmer Corporation, The: *See*—
Drews, Udo W.; and Shifrin, Norman, 4,135,820, Cl. 356-320.000.

Perkins, Roger: *See*—
Nagel, Hartmut; and Perkins, Roger, 4,135,953, Cl. 148-103.000.

Perkins, Stephen P.: *See*—
Wormser, Alex F.; and Perkins, Stephen P., 4,135,885, Cl. 422-142.000.

Persson, Leif; Hansen, Bonde; and Eklund, Erik, to AG Licento. Electrolytic chlorinator. 4,136,005, Cl. 204-266.000.

Peruhag A.G.: *See*—
Bober, Heinrich; and Hollenstein, Othmar, 4,136,002, Cl. 204-225.000.

Peterson, David C., to Upjohn Company, The. Inter-oxa-12,13(E)-didehydro-13,14-dihydro-9,10-didehydro-9-deoxy-PGD$_1$ compounds. 4,136,109, Cl. 562-503.000.

Peterson, Durey H.: *See*—
De Boer, Clarence; Dolak, Lester A.; and Peterson, Durey H., 4,136,171, Cl. 424-117.000.

Peterson, Marvin L.; and Oertle, Donald H., to Continental Oil Company. Porous material crack detection. 4,135,386, Cl. 73-40.000.

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Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.

Petrie, Harold L.: *See*—
Brown, Francis B.; Erickson, John W.; and Petrie, Harold L., 4,135,861, Cl. 417-183.000.

Petzold, Manfred; Uphues, Gunter; and Waltenberger, Peter, to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA). Cationic textile agent compositions having an improved cold water solubility. 4,136,054, Cl. 252-301.210.

Petzsch, Lothar; and Rentel, Alfred, to Seitz-Werke GmbH. Control valve for gaseous and liquid media. 4,135,699, Cl. 251-320.000.

Pfeil, Emanuel; and Broemer, Heinz, to Ernst Leitz Wetzlar GmbH. Sintered composite material, a process of making same, and a method of using same. 4,135,935, Cl. 106-35.000.

Pfizer Inc.: *See*—
Holland, Gerald F., 4,136,180, Cl. 424-244.000.
Kuhla, Donald E., 4,136,096, Cl. 260-306.70R.
Nagel, Arthur A., 4,136,253, Cl. 536-9.000.

Phillips Petroleum Company: *See*—
Brady, Donnie G., 4,136,082, Cl. 260-45.9AD.
Hogan, John P.; and Witt, Donald R., 4,136,061, Cl. 252-458.000.
Hsieh, Henry L.; and Naylor, Floyd E., 4,136,137, Cl. 260-880.00B.
Nikkel, Ronnie D., 4,135,511, Cl. 28-221.000.
Reese, Herbert E., 4,135,949, Cl. 134-18.000.
Williams, Ralph P.; and Howard, William S., 4,136,077, Cl. 260-32.400.

Pick, George G.: *See*—
Szabo, Francis S.; and Pick, George G., 4,135.794, Cl. 354-5.000.

Pickering, Ralph W.: *See*—
Matthew, Ian G.; Pickering, Ralph W.; Suzuki, Takashi; and Uchida, Hisashi, 4,135,912, Cl. 75-10.00R.

Piepho, Sandra L.: *See*—
McNeil, Mark D.; Goldstein, Robert H.; Stahl, Robert M.; and Piepho, Sandra L., 4,135,883, Cl. 422-72.000.
Pierce, Darrel J. Astronomical timepiece. 4,136,397, Cl. 364-569.000.
Pigott, Ronald, to Westinghouse Electric Corp. Pinned root turbine blade providing maximum friction damping. 4,135,849, Cl. 415-119.000.
Pilie, Roland J.; and Dahm, Douglas B., to Calspan Corporation. Catch basin interceptor. 4,136,010, Cl. 210-164.000.
Pioneer Electronic Corporation: *See*—
Tsukagoshi, Tsunehiro; Touma, Teruo; and Kimura, Masami, 4,135,601, Cl. 181-167.000.
Pioneer Works: *See*—
Senior, Adrain; and Gilman, Richard, 4,135,774, Cl. 339-7.000.
Pitney-Bowes, Inc.: *See*—
Dlugos, Daniel F., 4,135,662, Cl. 235-304.000.
Morrison, Douglas I., 4,135,808, Cl. 355-14.000.
Pitschi, Franz X., to Spinner GmbH. Method of securing HF-coaxial connector with a coupling ring. 4,135,288, Cl. 29-443.000.
Plaisted, Anthony C., to Celtite, Inc. Fast acting polyester adhesive systems and method of use. 4,136,134, Cl. 260-861.000.
Playart Limited: *See*—
Tong, Duncan, 4,135,326, Cl. 46-92.000.
Podlejski, Jerzy: *See*—
Kulesza, Janusz; Miler, Kazimierz; Podlejski, Jerzy; Gora, Jozef; Czajkowska, Teresa; Kozlowski, Zbigniew; Kolska, Jadwiga; Stolowska, Jolanta; and Rutkowski, Zygmunt, 4,136,206, Cl. 426-431.000.
Pogonowski, Ivo C.; and Fowler, Joe R., to Texaco Inc. Ocean oil skimmer for continuous removal of oil from the open sea method. 4,136,008, Cl. 210-83.000.
Pokowitz, Wolf D.: *See*—
Mohr, Paul; and Pokowitz, Wolf D., 4,135,368, Cl. 62-133.000.
Polaroid Corporation: *See*—
Slavitter, Frederick, 4,135,798, Cl. 354-163.000.
Thomas, Paul W., 4,135,793, Cl. 352-27.000.
Polinsky, Murray A., to RCA Corporation. Bipolar transistor with high-low emitter impurity concentration. 4,136,353, Cl. 357-34.000.
Politechnika Lodzka, Instytut Brzemyuslu Miesnego: *See*—
Kulesza, Janusz; Miler, Kazimierz; Podlejski, Jerzy; Gora, Jozef; Czajkowska, Teresa; Kozlowski, Zbigniew; Kolska, Jadwiga; Stolowska, Jolanta; and Rutkowski, Zygmunt, 4,136,206, Cl. 426-431.000.
Pollitzer, Ernest L.: *See*—
Hayes, John C.; and Pollitzer, Ernest L., 4,136,064, Cl. 252-466.00B.
Polysar Limited: *See*—
Hargreaves, Brian; and Richmond, Michael H., 4,136,142, Cl. 264-53.000.
Ponce, Fred H. Microfilm recording and developing apparatus. 4,135,809, Cl. 355-27.000.
Poole, Michael J., to BICC Limited. Manufacture of extruded products. 4,136,132, Cl. 260-827.000.
Popov, Vladimir F.: *See*—
Barbakadze, Dzhondo F.; Zamechnik, Frants F.; Popov, Vladimir F.; and Bykov, Pavel A., 4,135,920, Cl. 75-130.00R.
Poque, Dionysius J.: *See*—
Senger, Gerhard F.; and Poque, Dionysius J., 4,135,566, Cl. 152-361.0FP.
Porter, Philip: *See*—
Parry, Stephen H.; and Porter, Philip, 4,136,167, Cl. 424-87.000.
Portescap: *See*—
Aubert, Francois; and Heyraud, Marc, 4,136,294, Cl. 310-220.000.
PPG Industries, Inc.: *See*—
Welch, Cletus N., 4,135,995, Cl. 204-98.000.
Zwack, Robert R.; and Christenson, Roger M., 4,136,025, Cl. 210-23.00H.
Pracht, Hans J.; and Burns, Michael E., to Procter & Gamble Company, The. Fabric conditioning compositions containing methyl cellulose ether. 4,136,038, Cl. 252-8.800.
Pramoda, Matura K.; and Lin, Song-Ling, to American Home Products Corp. Mixed xanthan gum and locust beam gum therapeutic compositions. 4,136,173, Cl. 424-177.000.
Pramoda, Maturu K.: *See*—
Lin, Song-Ling; and Pramoda, Maturu K., 4,136,177, Cl. 424-211.000.
Lin, Song-Ling; and Pramoda, Maturu K., 4,136,178, Cl. 424-211.000.
Price, William L., to Advanced Micro Devices, Inc. Process of making platinum silicide fuse links for integrated circuit devices. 4,135,295, Cl. 29-623.000.
Prince, Dominique: *See*—
Moulin, Michele; Escher, Balint; Prince, Dominique; and Vasseux, Jean, 4,135,990, Cl. 204-32.00R.
Pripadchev, Vadim Y.: *See*—
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.
Privoznik, Louis J.: *See*—
Light, Stanley C., Jr.; and Privoznik, Louis J., 4,135,701, Cl. 266-57.000.
Prochnow, Jurgen; and Trommsdorff, Wolf, to Rheinmetall GmbH; and Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Projectile for attacking small targets. 4,135,449, Cl. 102-52.000.
Procter & Gamble Company, The: *See*—
Gault, Terrell W.; and Maguire, Edward J., Jr., 4,136,045, Cl. 252-135.000.
Pracht, Hans J.; and Burns, Michael E., 4,136,038, Cl. 252-8.800.
Prolizenz AG.: *See*—
Elhaus, Friedrich W.; and Hilge, Bernhard, 4,135,704, Cl. 266-261.000.
Prost-Marechal, Jacques: *See*—
Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, 4,136,195, Cl. 424-304.000.
Pruett, Barry B., to E-Systems, Inc. Electrolytic etching of tin oxide films. 4,135,989, Cl. 204-129.100.
Puccini, John L.; and Shea, Edward F., Jr. Tools for imprinting non-repeating stone patterns in fresh concrete. 4,135,840, Cl. 404-93.000.
Pullman Incorporated: *See*—
Welsh, Patrick G., 4,135,456, Cl. 105-135.000.
Quarderer, George J.: *See*—
Moll, Norman G.; and Quarderer, George J., 4,136,013, Cl. 208-10.000.
Quattlebaum, Robert W., to W. R. Grace & Co. Container and method for packaging meat articles. 4,136,205, Cl. 426-412.000.
Quinton, Geoffrey N.: *See*—
Beaumont, Thomas N.; Robinson, Norman; and Quinton, Geoffrey N., 4,136,151, Cl. 423-166.000.
R. O. Hull & Company, Inc.: *See*—
Canaris, Valerie M.; and Willis, William J., 4,135,991, Cl. 204-43.00S.
R. W. Mac Company: *See*—
MacDonnell, Robert W.; and Shander, Otto A., 4,135,833, Cl. 403-43.000.
Ragard, Phillip A.; and Matson, Crawford A., to Universal Instruments Corporation. Multiple lead cut and clinch mechanism. 4,135,558, Cl. 140-105.000.
Ragle, Herbert U.: *See*—
DeMoss, Dean L.; and Ragle, Herbert U., 4,136,368, Cl. 360-98.000.
Rardin, Jack A.; and James, Gregory A. Plastic file sleeve and index cards. 4,135,624, Cl. 206-425.000.
Rassey, Louis J. Modular engine construction. 4,135,478, Cl. 123-59.00R.
Rau Fastener, A Division of U.S. Industries, Inc.: *See*—
Silverbush, Herbert M., 4,135,287, Cl. 29-432.000.
Rauma-Rapola Oy: *See*—
Toivonen, Martti, 4,136,028, Cl. 210-73.00R.
Ray, Ranjan: *See*—
Tanner, Lee E.; and Ray, Ranjan, 4,135,924, Cl. 75-159.000.
Raychem Corporation: *See*—
Diaz, Stephen H., 4,135,587, Cl. 174-92.000.
Evans, Joseph H.; and Wolfe, Richard B., 4,135,553, Cl. 138-141.000.
Hughes, John R., 4,135,743, Cl. 285-115.000.
Lyons, Bernard J., 4,136,055, Cl. 252-404.000.
Raymond Lee Organization, Inc.: *See*—
Patton, Henry W. J., 4,135,652, Cl. 223-116.000.
Raytheon Company: *See*—
Rowland, Howard J.; and deBettencourt, Joseph T., 4,135,579, Cl. 166-248.000.
RCA Corporation: *See*—
Chan, Robert H. G.; Mann, Martin R.; and McDonnell, Francis M., 4,136,399, Cl. 364-900.000.
Clemens, Jon K.; and Ross, Michael D., 4,136,358, Cl. 358-11.000.
Morrell, Albert M., 4,136,300, Cl. 313-403.000.
Polinsky, Murray A., 4,136,353, Cl. 357-34.000.
Rea, Andrew. Cutting tool. 4,135,845, Cl. 407-3.000.
Reale, Richard C., to Minnesota Mining and Manufacturing Company. Femoral prosthesis trial fitting device. 4,135,517, Cl. 128-303.00R.
Rebers, Paul A.; and Heddleston, Kenneth L., to United States of America, Agriculture. Cross-protective fowl cholera bacterins. 4,136,169, Cl. 424-92.000.
Rebish, Edward J.: *See*—
Drobnik, Leszek R.; and Rebish, Edward J., 4,135,569, Cl. 164-158.000.
Rebsamen, August, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for controlling the speed of a packaging machine. 4,135,346, Cl. 53-494.000.
Recherche et Industrie, Therapeutiques, RIT: *See*—
Dobrescu, Lucia; Huygelen, Constant; and Van Wijnendaele, Frans, 4,136,181, Cl. 424-92.000.
Reed, Samuel F.; and Barrett, James H., to Rohm and Haas Company. Hybrid ion exchange resins with improved properties. 4,136,067, Cl. 521-32.000.
Reese, Herbert E., to Phillips Petroleum Company. Safety interlock for pipeline pig launcher and receiver. 4,135,949, Cl. 134-18.000.
Regan Offshore International, Inc.: *See*—
Watkins, Bruce J., 4,135,841, Cl. 405-196.000.
Rege, James R.: *See*—
White, James F.; and Rege, James R., 4,136,110, Cl. 562-532.000.
Regie Nationale des Usines Renault: *See*—
Martineau, Philippe; and Lallement, Serge, 4,135,562, Cl. 141-285.000.
Reich, Sanford; and Gates, William H., to Medtronic, Inc. Centrifugal blood pump for cardiac assist. 4,135,253, Cl. 3-1.700.
Reifeiss, Lester F.: *See*—
Allgeyer, David F.; Musgrave, Donald A.; and Reifeiss, Lester F., 4,135,369, Cl. 62-251.000.
Reimann, Hubertus; Hahn, Werner; and Welzel, Herbert, to VEB

Pentacon Dresden Kamera und Kinowerke. Photographic camera with flashlight contacts. 4,135,799, Cl. 354-147.000.

Reinhard, Russell R.: *See*—
Dorawala, Tansukhlal G.; and Reinhard, Russell R., 4,136,129, Cl. 260-672.00R.

Reith, Timothy M.: *See*—
Gniewek, John J.; Reith, Timothy M.; Sullivan, Michael J.; and White, James F., 4,135,998, Cl. 204-192.00E.

Reitknecht, Jack. Laminated fountain toothbrush with barrier. 4,135,831, Cl. 401-175.000.

Reitz, Johannes; Stark, Erich; and Schneck, Dieter, to Karl Schmidt GmbH. Piston and cylinder for two-cycle engines. 4,135,479, Cl. 123-73.0AA.

Reliance Glass Works: *See*—
Winkler, Lyle D., 4,135,866, Cl. 422-103.000.

Rembold, Heinz: *See*—
Baumann, Dieter; and Rembold, Heinz, 4,136,086, Cl. 528-99.000.

Rensland, Thomas E.; and Karrip, Alexander A., to Steelcase Inc. Chair back with polymer spring. 4,135,836, Cl. 403-120.000.

Rentel, Alfred: *See*—
Petzsch, Lothar; and Rentel, Alfred, 4,135,699, Cl. 251-320.000.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, to Boehringer Ingelheim GmbH. N-Aryl-N'-(phenyl-or phenoxy-alkyl)-piperazines and salts thereof. 4,136,185, Cl. 424-251.000.

Rentmeester, Paul C.: *See*—
Stanke, Dennis A.; Rentmeester, Paul C.; and Ulland, Paul D., 4,135,396, Cl. 73-204.000.

Renzoni, Louis S.: *See*—
Illis, Alexander; and Renzoni, Louis S., 4,135,913, Cl. 75-21.000.

Reschke, Helmut: *See*—
Anger, Klaus; Lischke, Burkhard; Oelmann, Andreas; and Reschke, Helmut, 4,136,285, Cl. 250-492.00A.

Resh, Mark S., to HurletronAltair, Inc. Lateral register control system and method. 4,135,664, Cl. 235-475.000.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Exhaust gas recirculation pre-stratified charge. 4,135,481, Cl. 123-119.00A.

Reuter, Franz G.: *See*—
Hilterhaus, Karl H.; Reuter, Franz G.; and Menzel, Tankred, 4,136,238, Cl. 521-107.000.

Reuter, Fritz: *See*—
Schmidt, Friedrich H.; and Reuter, Fritz, 4,135,440, Cl. 98-31.000.

Reuter Technologie GmbH: *See*—
Hilterhaus, Karl H.; Reuter, Franz G.; and Menzel, Tankred, 4,136,238, Cl. 521-107.000.

Rew, James A.; Simon, Albert B.; and Fahey, Thomas M., to United States of America, Air Force. Deformable heat transfer fin. 4,135,298, Cl. 29-727.000.

Reynolds Metals Company: *See*—
Brooks, Carson L., 4,135,568, Cl. 164-147.000.

Rheem Manufacturing Company: *See*—
Nozaki, Michio B., 4,136,001, Cl. 204-196.000.

Rheinmetall GmbH: *See*—
Prochnow, Jurgen; and Trommsdorff, Wolf, 4,135,449, Cl. 102-52.000.

Rhone-Poulenc Industries: *See*—
Bouy, Pierre; Bachot, Jean; and Bourgeois, Jean-Luc, 4,135,996, Cl. 204-98.000.

Ri-El Ricerche Elettroniche S.p.A.: *See*—
Righi, Nardino, 4,136,367, Cl. 360-96.000.

Ricca, Tom L. Attachment for an electronic watch system. 4,135,358, Cl. 58-23.00R.

Ricci, Ronald L., to Exxon Research & Engineering Co. Converter system. 4,136,382, Cl. 363-137.000.

Richdel, Inc.: *See*—
Saarem, Myrl J.; and Soukup, Dale F., 4,135,696, Cl. 251-30.000.

Richmon, Joe B.: *See*—
Corley, Foss E.; and Richmon, Joe B., 4,135,979, Cl. 195-31.00P.

Richmond, Michael H.: *See*—
Hargreaves, Brian; and Richmond, Michael H., 4,136,142, Cl. 264-53.000.

Rickard, James H., to Ovation Instruments, Inc. Stringed instrument bridge. 4,135,426, Cl. 84-1.160.

Ricoh Co., Ltd.: *See*—
Hashimoto, Mitsuru; Ohta, Masafumi; and Kozima, Akio, 4,135,928, Cl. 96-1.50R.

Rideout, Janet E.; Miller, Richard L.; and Elion, Gertrude B., to Burroughs Wellcome Co. Purine nucleotide antiviral composition and methods of use. 4,136,175, Cl. 424-180.000.

Ridley, Kenneth A., to Ciba-Geigy AG. Curtain coating apparatus. 4,135,477, Cl. 118-325.000.

Riemann, Werner: *See*—
Schindler, Johannes G.; and Riemann, Werner, 4,135,999, Cl. 204-195.00M.

Rifkin, Morton S.: *See*—
Evans, Arthur A.; and Rifkin, Morton S., 4,135,376, Cl. 70-100.000.

Righi, Nardino, to Ri-El Ricerche Elettroniche S.p.A. Apparatus for reproducing and/or recording magnetic tape in cassettes. 4,136,367, Cl. 360-96.000.

Rikagaku Kenkyusho: *See*—
Horikoshi, Koki; and Nakamura, Nobuyuki, 4,135,977, Cl. 195-7.000.

Rimppi, Martti; and Turunen, Olavi, to Oy Wartsila AB. Method for reducing propeller noise. 4,135,469, Cl. 114-270.000.

Rink, Donald R., to Union Carbide Corporation. Method of cleaning surfaces with CO_2-neutralized amine compositions. 4,135,947, Cl. 134-4.000.

Riondel, Pierre: *See*—
Baechler, Urs; and Riondel, Pierre, 4,136,304, Cl. 318-372.000.

Rittner, Edmund S., to Communications Satellite Corporation. Radiation hardened solar cell. 4,135,950, Cl. 136-89.0SJ.

Rives, Joe F.: *See*—
Carson, Forrest L.; and Rives, Joe F., 4,135,859, Cl. 417-9.000.

Rivoli, Anthony L.: *See*—
Gasner, John T.; and Rivoli, Anthony L., 4,135,955, Cl. 148-187.000.

Robert Bosch GmbH, Firma: *See*—
Rudiger, Gunter, 4,135,334, Cl. 51-273.000.

Roberts, Alan G., to Cogas Development Company. Mixing method and device. 4,135,893, Cl. 55-82.000.

Roberts, Charles K. Portable door lock. 4,135,748, Cl. 292-298.000.

Roberts, Leo L.: *See*—
Davis, Lee W.; Hollingsworth, James S.; and Roberts, Leo L., 4,135,863, Cl. 417-420.000.

Roberts, Roy D.: *See*—
Weber, T. Jerome; and Roberts, Roy D., 4,135,254, Cl. 3-26.000.

Robertson, Terrence M.; and Smith, Larry G., to Stauffer Chemical Company. System for diminishing the emission of noxious gases. 4,136,153, Cl. 423-242.000.

Robinson, Norman: *See*—
Beaumont, Thomas N.; Robinson, Norman; and Quinton, Geoffrey N., 4,136,151, Cl. 423-166.000.

Rockefeller University, The: *See*—
Clarkson, Allen B., Jr.; and Brohn, Fredrick H., 4,136,198, Cl. 424-320.000.

Rockwell International Corporation: *See*—
Anderson, Gordon H., 4,135,742, Cl. 285-87.000.
Caswell, Robert L.; and Griffith, Glen R., 4,136,400, Cl. 364-900.000.
Kephart, Gerald W.; and White, Stanley A., 4,136,287, Cl. 307-221.00D.
MacLeod, John G., 4,135,544, Cl. 137-246.220.
Workman, Harold W., 4,136,258, Cl. 178-68.000.

Rockwell-Rimoldi S.p.A.: *See*—
Sanvito, Robert, 4,135,464, Cl. 112-121.150.

Rogan, John B.; and White, Steven A., to Standard Oil Company (Indiana). Viscosity index improvers. 4,136,047, Cl. 252-56.00R.

Rohm and Haas Company: *See*—
Reed, Samuel F.; and Barrett, James H., 4,136,067, Cl. 521-32.000.

Rojas, Ismael E.: *See*—
Casey, John A.; and Rojas, Ismael E., 4,135,946, Cl. 127-11.000.

Rolls-Royce Limited: *See*—
Peill, Peter G., 4,135,855, Cl. 416-90.00R.

Romano, Nicholas A. Orthopedic device. 4,135,503, Cl. 128-78.000.

Romanov, Gennady A.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Romine, Donald J.: *See*—
Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., 4,136,000, Cl. 204-195.00S.

Rose, Charles E.: *See*—
Westlin, Karl; and Rose, Charles E., 4,135,900, Cl. 55-499.000.

Rose, James W. S.: *See*—
Tamblyn, Robert T.; Rose, James W. S.; Silverthorne, Paul N.; and Broadhead, Gordon K., 4,135,571, Cl. 165-18.000.

Rose, William H., to AMP Incorporated. Push to talk switch. 4,136,268, Cl. 200-17.00R.

Rosenbaum, Walter S.: *See*—
Kolpek, Robert A.; MacDuffee, David L.; and Rosenbaum, Walter S., 4,136,395, Cl. 364-518.000.

Rosenberg, Ira E.; Ferguson, John A.; and Loveless, Norman P., to Clairol Incorporated. Process for reducing critical surface tension and coefficient of friction in hair. 4,135,524, Cl. 132-7.000.

Rosengard, Alex, to Commissariat a l'Energie Atomique. Device for centrifugally separating the components of a gas mixture. 4,135,898, Cl. 55-419.000.

Rosensweig, Ronald E., to Exxon Research & Engineering Co. Hydrocarbon conversion process utilizing a magnetic field in a fluidized bed of catalitic particles. 4,136,016, Cl. 208-134.000.

Rosey, Richard; Kovatch, George N.; Tomasic, Nicholas A.; and Simon, Ned H., to Westinghouse Electric Corp. Electrical switchboard apparatus including double-flanged vertical riser conductors. 4,136,374, Cl. 361-342.000.

Rosin, Stanley A. Device for retrieving dog feces, and the like. 4,135,750, Cl. 294-19.00R.

Ross, John P.; and Bernardi, Carl E., to National Semiconductor Corporation. Header lead roller. 4,135,557, Cl. 140-105.000.

Ross, Michael D.: *See*—
Clemens, Jon K.; and Ross, Michael D., 4,136,358, Cl. 358-11.000.

Ross, Robert E.: *See*—
Fernandez, Jose M.; McCreary, Michael D.; Ross, Robert E.; and Staples, Jon T., 4,135,929, Cl. 96-29.00D.

Rossi, Albert, to Exxon Research & Engineering Co. Flow improvers for crude and residual-containing fuel oils. 4,135,887, Cl. 44-62.000.
Rossmy, Gerd, to Th. Goldschmidt AG. Process for preparing polysiloxane-polyoxyalkylene mixed block polymerizates. 4,136,239, Cl. 521-111.000.
Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Hrboticky, Karel, 4,135,615, Cl. 198-371.000.
Roubal, Zdenek: *See*—
Fisnerova, Ludmila; Grimova, Jaroslava; Roubal, Zdenek; and Nemecek, Oldrich, 4,136,194, Cl. 424-274.000.
Roush, Gregory C.: *See*—
Kinsey, Lloyd E.; and Roush, Gregory C., 4,135,452, Cl. 102-214.000.
Roussel Uclaf: *See*—
Nedelec, Lucien; Torelli, Vesperto; and Fournex, Robert, 4,136,179, Cl. 424-242.000.
Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, 4,136,195, Cl. 424-304.000.
Roux, Jean. Tool for opening and closing wrist watches. 4,135,416, Cl. 81-5.10R.
Rowland, Howard J.; and deBettencourt, Joseph T., to Raytheon Company. In situ processing of organic ore bodies. 4,135,579, Cl. 166-248.000.
Rowsell, David G.; and Hems, Roger, to Wilkinson Sword Limited. Certain substituted amides having a physiological cooling effect. 4,136,164, Cl. 424-64.000.
Rowsell, David G.: *See*—
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,136,163, Cl. 424-54.000.
Ruda, Mikhail Y.: *See*—
Chazov, Evgeny I.; Ruda, Mikhail Y.; Burynin, Vitaly A.; and Lokshin, Moisei A., 4,135,496, Cl. 128-1.00D.
Rudbach, Michael, to Udo Schutz KG. Outlet pipe closure for liquid containers. 4,135,636, Cl. 220-265.000.
Rudd, Wallace C., to Thermatool Corporation. Method of manufacturing heat exchange panels. 4,136,272, Cl. 219-107.000.
Rudiger, Gunter, to Robert Bosch GmbH, Firma. Dust exhaust hood. 4,135,334, Cl. 51-273.000.
Ruetschi, Paul, to Leclanche S.A. Long-life alkaline primary battery. 4,136,236, Cl. 429-206.000.
Rufenacht, Kurt: *See*—
Boger, Manfred; Beriger, Ernst; Drabek, Jozef; Durr, Dieter; and Rufenacht, Kurt, 4,136,106, Cl. 260-456.00A.
Rusbach, Maurice, to Sarmac S.A. Fuze plug, particularly for use in a hand grenade. 4,135,451, Cl. 102-64.000.
Ruter, Jorn: *See*—
Burzin, Klaus; and Ruter, Jorn, 4,136,098, Cl. 260-343.000.
Rutherford, Ernest. Dishwasher. 4,135,532, Cl. 134-100.000.
Rutkowski, Zygmunt: *See*—
Kulesza, Janusz; Miler, Kazimierz; Podlejski, Jerzy; Gora, Jozef; Czajkowska, Teresa; Kozlowski, Zbigniew; Kolska, Jadwiga; Stolowska, Jolanta; and Rutkowski, Zygmunt, 4,136,206, Cl. 426-431.000.
Ryan, Francis. Vanity storing step. 4,135,604, Cl. 182-91.000.
Ryan, James H.: *See*—
Ailawadhi, Manohar L.; Ryan, James H.; and Wahi, Chander M., 4,135,776, Cl. 339-177.00R.
Saarem, Myrl J.; and Soukup, Dale F., to Richdel, Inc. Pilot operated diaphragm valve. 4,135,696, Cl. 251-30.000.
Sagi, Zeev: *See*—
Farrell, John H.; Lawrie, Eugene G.; and Sagi, Zeev, 4,136,390, Cl. 364-474.000.
Saint-Gobain Industries: *See*—
Bourelier, Claude; Orain, Roger; Pelzer, Rudolf; Schaefer, Wolfgang; and Schindler, Siegfried, 4,136,214, Cl. 427-169.000.
Saito, Kazumi: *See*—
Nakao, Toshihiro; and Saito, Kazumi, 4,136,344, Cl. 343-702.000.
Saito, Masato; Watanabe, Keiji; and Fukuyama, Keiji, to Mitsubishi Denki Kabushiki Kaisha. Electrode of discharge lamp. 4,136,227, Cl. 428-389.000.
Saito, Shoichi, to Olympus Optical Co., Ltd. Tape cassettes having indications for blind use. 4,135,316, Cl. 35-35.00A.
Saito, Toshio: *See*—
Aikawa, Akira; Oguchi, Masao; Takeda, Toshihide; Kisaichi, Akio; and Saito, Toshio, 4,135,877, Cl. 8-115.500.
Sakaguchi, Masayuki: *See*—
Yoshizawa, Tadao; and Sakaguchi, Masayuki, 4,135,961, Cl. 156-242.000.
Sakai, Takeshi: *See*—
Tsuzi, Shoichi; Aoki, Kiyoshi; Sakai, Takeshi; Ikebe, Hiroshige; and So, Dogi, 4,135,874, Cl. 431-115.000.
Sakaida, Atsuo: *See*—
Hishida, Yukio; Asai, Yuichi; Kondo, Toshikatsu; Asai, Akira; Sakaida, Atsuo; and Miyazawa, Chiaki, 4,135,830, Cl. 400-124.000.
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; Sasaki, Kanemichi; and Hasegawa, Kouji, to Nippon Kayaku Kabushiki Kaisha; and Chugai Seiyaku Kabushiki Kaisha. Composition and method for treating or preventing fowl coccidiosis. 4,136,191, Cl. 424-279.000.
Sakamoto, Masakatsu: *See*—
Ogi, Kenji; and Sakamoto, Masakatsu, 4,135,600, Cl. 181-156.000.
Sakamoto, Yusuke; Kinugasa, Munetaka; Endo, Shigeki; Yamane, Mituo; and Fujie, Shigeyoshi, to Osaka Gas Company Limited. Method for treating water. 4,136,027, Cl. 210-63.00Z.
Salomon, Georges P. J., to S.A. des Etablissements Francois Salomon & fils. Devices mounted on a ski. 4,135,728, Cl. 280-605.000.
Salomon, Georges P. J., to S.A. Salomon Etablissements Francois Salomon & Fils. Safety bindings for skis. 4,135,733, Cl. 280-612.000.
Salomon, Georges P. J., to Etablissements Francois Salomon et fils. Ski binding. 4,135,734, Cl. 280-618.000.
Salon, Sheppard J.; and Montgomery, Lon W., to Westinghouse Electric Corp. Method and apparatus for detection of rotor faults in dynamoelectric machines. 4,136,312, Cl. 324-51.000.
Saltz, Ira M., to Lubliner/Saltz, Inc. Binder and apparatus for retaining leaves therein. 4,135,832, Cl. 402-15.000.
Samiran, David. Adjustable float and filter assembly. 4,136,009, Cl. 210-114.000.
Samoilov, Constantin. Needle holder. 4,135,458, Cl. 112-80.000.
Sanchez, Jose, to Pennwalt Corporation. Monoperoxycarbonates. 4,136,105, Cl. 260-453.0RZ.
Sanders Associates, Inc.: *See*—
Chicklis, Evan P.; and Naiman, Charles S., 4,136,316, Cl. 331-94.50F.
Jarvinen, Philip, 4,135,489, Cl. 126-270.000.
Sanders, James M.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
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Sanders, Robert N.: *See*—
Johnston, James D.; Starrett, Richmond M.; and Sanders, Robert N., 4,136,113, Cl. 260-544.00Y.
Sandoz, Inc.: *See*—
Houlihan, William J., 4,136,184, Cl. 424-250.000.
Nadelson, Jeffrey, 4,136,114, Cl. 260-559.00A.
Sandoz Ltd.: *See*—
Steinemann, Willy, 4,136,033, Cl. 546-258.000.
Sandrock, Gary D.: *See*—
Turillon, Pierre P.; and Sandrock, Gary D., 4,135,621, Cl. 206-0.700.
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., to Nuovo Pignone S.p.A.; and ZNIKHBI:Tsentralny Nauchne:issledovatelsky institut khlopchatobumezhnoi promyshlennesti. Control for the weft-thread carries in the shed of a multished loom. 4,135,556, Cl. 139-436.000.
Sanvito, Robert, to Rockwell-Rimoldi S.p.A. Sewing unit for joining superimposed lengths of cloth. 4,135,464, Cl. 112-121.150.
Sapkus, Jurgis; and Lewis, J. Stephen, to Mattel, Inc. Doll construction with pivotable torso members. 4,135,327, Cl. 46-161.000.
Saran, Amitabh, to Xerox Corporation. Truncated run length encoding. 4,136,363, Cl. 358-261.000.
Saran, Herbert; Krings, Peter; Schwuger, Milan J.; and Smolka, Heinz, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Pourable washing compositions containing a luminosilicates and non-ionics and method for their preparation. 4,136,051, Cl. 252-91.000.
Sargis, Albert. Cycle handlebar rear view mirror assembly. 4,135,788, Cl. 350-307.000.
Sarmac S.A.: *See*—
Rusbach, Maurice, 4,135,451, Cl. 102-64.000.
Sasaki, Kanemichi: *See*—
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Sasaoka, Senzo: *See*—
Yoneyama, Masakazu; Fuseya, Yoshiharu; Kato, Norihiko; Sasaoka, Senzo; and Ishiguro, Shoji, 4,135,931, Cl. 96-66.300.
Sato, Akira: *See*—
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,135,933, Cl. 96-100.00R.
Hosokoshi, Kakuichiro; Nakamura, Hiroto; Sato, Akira; and Maeda, Masakazu, 4,135,930, Cl. 96-36.100.
Sato, Eiichi: *See*—
Nishikawa, Masaji; Sato, Eiichi; and Yanagisawa, Kazuhisa, 4,135,811, Cl. 355-3.0SC.
Savall, Vincent: *See*—
Louboutin, Robert; and Savall, Vincent, 4,136,012, Cl. 210-208.000.
Savitsky, Evgeny M.: *See*—
Molochnikov, Viktor V.; Efimov, Vasily I.; Veraxo, Anatoly S.; and Savitsky, Evgeny M., 4,136,313, Cl. 324-57.00R.
Scardenzan, Anthony. Cover assembly for swimming pool. 4,135,259, Cl. 4-172.110.
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenylbutanol derivatives, processes for their preparation and compositions containing them. 4,136,200, Cl. 424-341.000.
Schaefer, Wolfgang: *See*—
Bourelier, Claude; Orain, Roger; Pelzer, Rudolf; Schaefer, Wolfgang; and Schindler, Siegfried, 4,136,214, Cl. 427-169.000.
Schafer, Horst: *See*—
Tursky, Werner; Chadda, Madan; and Schafer, Horst, 4,135,291, Cl. 29-574.000.
Schafer, Otmar U. Method and apparatus for the alternate heating and

cooling of a heat exchanger of a heating and cooling system. 4,135,572, Cl. 165-61.000.
Schainholz, Herbert. Supports for instrument sterilization. 4,135,868, Cl. 422-310.000.
Schalge, Roger D.; and Neos, Gus, to Drillco Equipment Company, Inc. Anchor for undercut bore. 4,135,432, Cl. 85-84.000.
Scharre, Normann; and Bartel, Siegfried, to AGFA-Gevaert AG. Cassette for light-sensitive photographic material. 4,135,802, Cl. 354-275.000.
Scheidler, Ralph E. Dual rate voltage regulator. 4,136,311, Cl. 322-28.000.
Scheidmeir, Walter: *See*—
Zinke-Allmang, Helmut; and Scheidmeir, Walter, 4,136,124, Cl. 568-591.000.
Schering Aktiengesellschaft: *See*—
Fuchs, Peter; and Hilmann, Jurgen, 4,136,145, Cl. 264-164.000.
Fuchs, Peter; and Hilmann, Jurgen, 4,136,162, Cl. 424-27.000.
Schering Corporation: *See*—
Assouly, Pierre, 4,135,510, Cl. 128-218.00R.
Nagabhushan, Tattanahalli L.; Turner, William N.; and Cooper, Alan, 4,136,254, Cl. 536-10.000.
Schiemann, Wolfram. Device for discharge nozzles on cans. 4,135,650, Cl. 222-572.000.
Schilling, Siegfried: *See*—
Kesselring, Fritz; and Schilling, Siegfried, 4,135,371, Cl. 62-477.000.
Schindler, Johannes G.; and Riemann, Werner, to Dr. E. Fresenius Chemisch pharmazeutische Industrie KG, Apparatebau KG. Ion sensitive electrode and cells for use therewith. 4,135,999, Cl. 204-195.00M.
Schindler, Siegfried: *See*—
Bourelier, Claude; Orain, Roger; Pelzer, Rudolf; Schaefer, Wolfgang; and Schindler, Siegfried, 4,136,214, Cl. 427-169.000.
Schlessel, Walter, to Gemco-Ware, Inc. Grinding mill for coffee beans and the like. 4,135,672, Cl. 241-169.100.
Schleubner, Hans: *See*—
Bonhard, Klaus; Boysen, Uwe; and Schleubner, Hans, 4,136,093, Cl. 260-112.50R.
Schmid-Schonbein, Holger, to Ernst Leitz GmbH. Apparatus for measuring the aggregation rate of particles. 4,135,819, Cl. 356-39.000.
Schmidt, Felix H.: *See*—
Hubner, Manfred; Heerdt, Ruth; Bosies, Elmar; Kuhnle, Hans; and Schmidt, Felix H., 4,136,197, Cl. 424-319.000.
Schmidt, Friedrich H.; and Reuter, Fritz. Method and apparatus for ventilating or air conditioning occupied rooms. 4,135,440, Cl. 98-31.000.
Schneck, Dieter: *See*—
Reitz, Johannes; Stark, Erich; and Schneck, Dieter, 4,135,479, Cl. 123-73.0AA.
Scholz, Hansjuergen; Jahn, Walter; and Gimbel, Juergen, to Daimler-Benz Aktiengesellschaft. Adjustable upper deflection fitting for a shoulder belt. 4,135,737, Cl. 280-747.000.
Schoppe, Wayne F.; and Winship, Bruce A., to Xerox Corporation. Registration system for a reproducing machine. 4,135,804, Cl. 355-3.0SH.
Schreiber, William L.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
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Schreves, Inc.: *See*—
Wagner, Robert L., 4,135,588, Cl. 175-19.000.
Schroeder, Harry: *See*—
Guttenberger, Peter; and Schroeder, Harry, 4,135,297, Cl. 29-629.000.
Schromm, Kurt: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,136,185, Cl. 424-251.000.
Schroter, Herbert; and Stein, Eckehard, to Hoechst Aktiengesellschaft. Process and apparatus for the production of photocopies using two-component diazotype material. 4,135,814, Cl. 355-106.000.
Schubert & Salzer: *See*—
Handschuch, Karl; and Konig, Reinhard, 4,135,276, Cl. 19-204.000.
Schulein, Rolf G.: *See*—
Liebscher, Johannes; and Schulein, Rolf G., 4,135,415, Cl. 81-3.38A.
Schumacher, Frederick A., to Silicon Technology Corporation. Sealing piston. 4,135,499, Cl. 125-15.000.
Schuster, Edward J.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
Schwarze, Manfred: *See*—
Fischer, Karl; and Schwarze, Manfred, 4,136,324, Cl. 337-139.000.
Schwertner, Larry V. Crop shredder apparatus and adapter. 4,135,349, Cl. 56-6.000.
Schwuger, Milan J.: *See*—
Saran, Herbert; Krings, Peter; Schwuger, Milan J.; and Smolka, Heinz, 4,136,051, Cl. 252-91.000.
Science Union et Cie, Societe Francaise de Recherche Medicale: *See*—
Fontanges, Robert, 4,136,168, Cl. 424-89.000.
SCM Corporation: *See*—
Hirschy, Linda M.; Kane, Bernard J.; and Traynor, Sean G., 4,136,126, Cl. 260-666.00A.
Scott, Brian J., to International Standard Electric Corporation. Amplifier arrangement for process controller. 4,136,307, Cl. 318-677.000.
Sealed Power Corporation: *See*—
Joseph, A. David; and Ward, Elmer E., 4,136,011, Cl. 210-168.000.
Sears, Daniel, to United States of America, Air Force. Liquid nitrogen level controller. 4,135,548, Cl. 137-392.000.
Sedlatschek, Robert, to Singer Company, The. Stitch pattern selection and display arrangement for sewing machines. 4,135,461, Cl. 112-158.00E.
Segal, Arthur R.: *See*—
Bertram, James T.; Segal, Steven A.; and Segal, Arthur R., 4,135,421, Cl. 83-835.000.
Segal, John A. A. A. G.: *See*—
Candlin, John P.; and Segal, John A. A. A. G., 4,136,057, Cl. 252-429.00B.
Segal, Steven A.: *See*—
Bertram, James T.; Segal, Steven A.; and Segal, Arthur R., 4,135,421, Cl. 83-835.000.
Segales, Jaime: *See*—
Smith, Alfred R.; and Segales, Jaime, 4,135,757, Cl. 296-35.00R.
Seifers, Monte G., to Digequip Security Industries, Inc. Timed alarming using logical inverters. 4,136,334, Cl. 340-529.000.
Seike, Yajuro; Matsuo, Yoshikuni; Nakashima, Masaru; Shojima, Toshikazu; and Masaaki, Shinohara, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for collecting effluent oil. 4,136,030, Cl. 210-242.00S.
Seita, Toru: *See*—
Takahashi, Kenji; Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,136,237, Cl. 521-27.000.
Seitz-Werke GmbH: *See*—
Petzsch, Lothar; and Rentel, Alfred, 4,135,699, Cl. 251-320.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi, 4,135,871, Cl. 425-377.000.
Semikron, Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See*—
Tursky, Werner; Chadda, Madan; and Schafer, Horst, 4,135,291, Cl. 29-574.000.
Senelonge, Henri. Machine for introducing measured amounts of liquids into vials and other receptacles. 4,135,561, Cl. 141-234.000.
Senger, Gerhard F.; and Poque, Dionysius J., to Uniroyal GmbH. Belted pneumatic tires. 4,135,566, Cl. 152-361.0FP.
Senior, Adrain; and Gilman, Richard, to Pioneer Works. Jointing members and joints. 4,135,774, Cl. 339-7.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device to check and discard lengths of wrapping material (foil) in very high speed packet cigarette packers. 4,135,344, Cl. 53-54.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Apparatus for adjusting the slope of side flaps of stacked cardboard blanks. 4,135,710, Cl. 271-165.000.
Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See*—
Imbert, Pierre L., 4,135,311, Cl. 34-57.00E.
Seymour, David J.: *See*—
Kirby, William E.; and Seymour, David J., 4,135,468, Cl. 114-260.000.
Shalavina, Elena S.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Shander, Otto A.: *See*—
MacDonnell, Robert W.; and Shander, Otto A., 4,135,833, Cl. 403-43.000.
Shannon, Thomas J., to Sherwood Medical Industries Inc. Fluid pressure manometer. 4,135,509, Cl. 128-2.05D.
Shaw, Frances M. Apparatus for dispensing fluids. 4,135,646, Cl. 222-144.000.
Shaw, Jerry; and Solitt, Samuel G. Counter top display unit. 4,136,380, Cl. 362-145.000.
Shea, Edward F., Jr.: *See*—
Puccini, John L.; and Shea, Edward F., Jr., 4,135,840, Cl. 404-93.000.
Shea, Philip J.: *See*—
Lewis, Jon; and Shea, Philip J., 4,136,182, Cl. 424-248.540.
Shen, James T. Gamma stick. 4,135,884, Cl. 422-59.000.
Shepherd, Robert G., to American Cyanamid Company. 4-(Monoalkylamino)benzoic acid imidates. 4,136,256, Cl. 544-88.000.
Sherwin, Walter M., to General Motors Corporation. Oxygen sensor temperature monitor for an engine exhaust monitoring system. 4,135,381, Cl. 73-23.000.
Sherwood Medical Industries Inc.: *See*—
Shannon, Thomas J., 4,135,509, Cl. 128-2.05D.
Shibata, Susumu; Nomoto, Tsutomu; and Murasugi, Keiji, to Oki Elec-

tric Industry Co., Ltd. Thermal head for a printer. 4,136,274, Cl. 219-216.000.
Shibata, Toshihiro: *See—*
Minagawa, Motonobu; Kubota, Naohiro; and Shibata, Toshihiro, 4,136,081, Cl. 260-45.80N.
Shield, Charles F., III: *See—*
Stoner, David L.; Shield, Charles F., III; Julian, Ronald G.; and Koegel, Ewald, 4,135,494, Cl. 128-1.00R.
Shifrin, Norman: *See—*
Drews, Udo W.; and Shifrin, Norman, 4,135,820, Cl. 356-320.000.
Shimabukuro, Hajime: *See—*
Katayama, Shitomi; Koyama, Nobuaki; Shimabukuro, Hajime; and Jin, Kiyoshi, 4,136,079, Cl. 260-37.00N.
Shimizu, Akihiko: *See—*
Takahashi, Kenji; Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,136,237, Cl. 521-27.000.
Shimizu, Osamu: *See—*
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,136,333, Cl. 340-147.00C.
Shimojo, Hirokazu; and Inamura, Toshio, to Kabushiki Kaisha Sigma Electronics Planning. Spark plug igniter comprising a DC-DC converter. 4,136,301, Cl. 315-209.00T.
Shinetsu Chemical Company: *See—*
Koyanagi, Shunichi; Tajima, Shigenobu; Kurimoto, Kazuhiko; and Kiri, Yoshitaka, 4,136,242, Cl. 526-74.000.
Shirane, Hideto: *See—*
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Sunnyland Farms, Inc.: *See*—
Nafziger, Marvin L.; and McMennamy, John A., 4,135,442, Cl. 99-582.000.
Sunouchi, Akio; Kozuki, Susumu; and Watanabe, Yoshiaki, to Canon Kabushiki Kaisha. Camera having film winding-to-rewinding control by releasing either of two buttons. 4,135,801, Cl. 354-214.000.
Surface Technology, Inc.: *See*—
Feldstein, Nathan, 4,136,216, Cl. 427-306.000.
Sutter, Melville B. Heat shielding tool. 4,135,573, Cl. 165-80.000.
Suttles, James M., to Mead Corporation, The. Shelving assembly. 4,135,837, Cl. 403-245.000.
Suzuki, Takashi: *See*—
Matthew, Ian G.; Pickering, Ralph W.; Suzuki, Takashi; and Uchida, Hisashi, 4,135,912, Cl. 75-10.00R.
Suzuki, Takeshi; Murao, Mikio; Utiyama, Susumu; Hatanaka, Kyohei; and Inoue, Hajime, to Kawasaki Jukogyo Kabushiki Kaisha; and Central Glass Co., Ltd. Premelting method for raw materials for glass and apparatus relevant thereto. 4,135,904, Cl. 65-27.000.
Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. Voltage sensing circuit of differential input type. 4,136,292, Cl. 307-355.000.
Sweet, David B., to B. F. Goodrich Company, The. Aircraft brush module. 4,136,295, Cl. 310-239.000.
Swenson, Edward L.; and Ankenman, Thomas W., to Hesston Corporation. Semicontinuous large round baling machine. 4,135,352, Cl. 56-341.000.
Swift & Company: *See*—
Murphy, Robert E.; and Bernholdt, Harry F., 4,136,203, Cl. 426-124.000.
Swiss Aluminum Ltd.: *See*—
Arnason, Tomas; and Blaska, Rudolf, 4,136,003, Cl. 204-247.000.
Sycor, Inc.: *See*—
Morgan, Samuel A., 4,136,369, Cl. 360-106.000.
Szabo, Francis S.; and Pick, George G., to Addressograph-Multigraph Corporation. Photocomposition machine. 4,135,794, Cl. 354-5.000.
Tachibana, Kyozo: *See*—
Okumura, Yoshio; Matsumoto, Genichi; Tachibana, Kyozo; and Nozaki, Yoshio, 4,136,305, Cl. 318-376.000.
Tachikawa, Hiroshi: *See*—
Eujita, Haruo; Ishikawa, Yasushi; Tachikawa, Hiroshi; and Nakamura, Taizo, 4,136,273, Cl. 219-121.00P.
Tacole Etablissement: *See*—
Durst, Heinz, 4,135,666, Cl. 238-10.00R.
Tada, Shoji: *See*—
Nagai, Nobuo; Watanabe, Tugio; and Tada, Shoji, 4,136,299, Cl. 313-325.000.
Tajima, Shigenobu: *See*—
Koyanagi, Shunichi; Tajima, Shigenobu; Kurimoto, Kazuhiko; and Kiri, Yoshitaka, 4,136,242, Cl. 526-74.000.
Takada, Haruhiko, to Diesel Kiki Co., Ltd. Rotary vane compressor with outlet check valve for start-up pressure on lubricant system. 4,135,865, Cl. 418-93.000.
Takahashi, Kenji; Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd. Process for preparing cation-exchange membrane by polymerizing lactone ring containing unsaturated monomer in the presence of fluorinated polymer. 4,136,237, Cl. 521-27.000.
Takahashi, Youske; and Akasaka, Hideki, to Nippon Kogaku K.K. Electrochromic element. 4,135,790, Cl. 350-357.000.
Takamizawa, Kinya; and Iinuma, Kazuhiro, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic wave transmitting and receiving apparatus. 4,136,325, Cl. 340-1.00R.
Takano, Mitsuo: *See*—
Yano, Nobumitsu; Fukinbara, Itaru; and Takano, Mitsuo, 4,136,065, Cl. 252-522.000.
Takeda, Toshihide: *See*—
Aikawa, Akira; Oguchi, Masao; Takeda, Toshihide; Kisaichi, Akio; and Saito, Toshio, 4,135,877, Cl. 8-115.500.
Takedoi, Atushi: *See*—
Horiishi, Nanao; Takedoi, Atushi; Kondo, Hiroyuki; Sumita, Hiroshi; Mukaizaka, Akira; and Matsui, Goro, 4,136,049, Cl. 252-62.560.
Takeguchi, Milton M.: *See*—
Simpson, Lynn B.; and Takeguchi, Milton M., 4,135,981, Cl. 195-127.000.
Takei, Haruo: *See*—
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,135,933, Cl. 96-100.00R.
Takesue, Masaru, to Nippon Telegraph and Telephone Public Corporation. Microprogrammed, multipurpose processor having controllable execution speed. 4,136,383, Cl. 364-200.000.
Tamblyn, Robert T.; Rose, James W. S.; Silverthorne, Paul N.; and Broadhead, Gordon K. Thermal storage systems. 4,135,571, Cl. 165-18.000.
Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Tamura, Sadahiro, 4,136,320, Cl. 333-82.0BT.
Tamura, Shuichi: *See*—
Masunaga, Makoto; Hosoe, Kazuya; Tsunekawa, Tokuichi; Tamura, Shuichi; and Yokota, Hideo, 4,135,815, Cl. 356-4.000.
Tan, Kwang G.: *See*—
Annunziata, Eugene J.; James, Robert S.; and Tan, Kwang G., 4,136,386, Cl. 364-200.000.
Tanaka, Gotaro: *See*—
Fujiwara, Kunio; Tanaka, Gotaro; and Kurosaki, Shiro, 4,135,901, Cl. 65-2.000.
Tanaka, Junzo; and Urashima, Chikao, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,136,271, Cl. 219-10.55F.
Tanaka, Keihachiro: *See*—
Ohsato, Nobuyoshi; Tanaka, Keihachiro; and Mizushima, Eiji, 4,135,903, Cl. 65-5.000.
Tanaka, Masaaki: *See*—
Hosoda, Taisei; Uzuhashi, Hideo; Kobayashi, Nobuyuki; and Tanaka, Masaaki, 4,135,370, Cl. 62-274.000.
Tanaka, Takashi: *See*—
Onoe, Katuhiko; and Tanaka, Takashi, 4,135,529, Cl. 133-3.00C.
Tanaka, Yasuyuki; and Nakajima, Kazuo, to Nippon Mektron Kabu-

shiki Kaisha. Method of manuf...turing die for embossing circuit pattern. 4,135,964, Cl. 156-661.000.

Taniai, Tadayoshi; and Yuda, Takuo, to Nifco, Inc. Molding clip. 4,135,277, Cl. 24-73.0PC.

Tanner, Lee E.; and Ray, Ranjan, to Allied Chemical Corporation. Filaments of zirconium-copper glassy alloys containing transition metal elements. 4,135,924, Cl. 75-159.000.

Tattersall, Edward G., to Hovermarine Transport Limited. Gas-cushion vehicles. 4,135,595, Cl. 180-117.000.

Tausch, Gilbert H., to Camco, Incorporated. Multiple pocket mandrel with fluid bypass. 4,135,576, Cl. 166-117.500.

Tauster, Samuel J.: *See*—
Fung, Shun C.; and Tauster, Samuel J., 4,136,213, Cl. 427-122.000.

Taylor, Paul D.: *See*—
Hwang, H. Shinn; and Taylor, Paul D., 4,136,104, Cl. 260-449.00R.

Taylor, Philip W. Wire duct with wire retaining clip. 4,136,257, Cl. 174-68.00C.

Taylor, Thomas N.; and Mahler, Charles J., to Xerox Corporation. Counterbalancing apparatus. 4,135,805, Cl. 355-3.00R.

Taylor, Thomas S.: *See*—
Neville, Mark H.; and Taylor, Thomas S., 4,136,345, Cl. 346-75.000.

Tebo, Kenneth L.: *See*—
Murphy, Thomas A.; Long, Richard E.; and Tebo, Kenneth L., 4,135,679, Cl. 242-128.000.

Teeney, David D.: *See*—
Harding, Maurice R.; and Teeney, David D., 4,135,271, Cl. 15-53.00B.

Teledyne Industries, Inc.: *See*—
Campbell, Joseph M., 4,135,428, Cl. 84-1.240.

Teledyne McCormick Selph: *See*—
Goddard, Terrence P.; and Thatcher, Donald N., 4,135,956, Cl. 149-22.000.

Temco Products, Inc.: *See*—
Thomas, Morton I., 4,135,535, Cl. 135-67.000.

Templin, Jackson R., to General Motors Corporation. Engine torque transducer using a spoked torque transmitting plate. 4,135,390, Cl. 73-136.00C.

te Nijenhuis, Anne: *See*—
den Otter, Marinus J. A. M.; and te Nijenhuis, Anne, 4,136,215, Cl. 427-204.000.

Tenneco Chemicals, Inc.: *See*—
Buono, Frederick J.; and Woods, William B., 4,135,945, Cl. 106-308.00N.

Tenney, Linwood P.; and Lane, Parley C., Jr., to B. F. Goodrich Company, The. Ring-opened iso-propylnorbornene copolymers. 4,136,247, Cl. 526-283.000.

Tenney, Linwood P., to B. F. Goodrich Company, The. Ring-opened alkylnorbornene copolymers. 4,136,248, Cl. 526-283.000.

Tenney, Linwood P.; and Lane, Parley C., Jr., to B F. Goodrich Company, The. Ring-opened copolymers of dihydrodiclopentadiene, norbornene or alkylnorbornene, and acyclic olefin. 4,136,249, Cl. 526-283.000.

Terry, Ruel C., to In Situ Technology, Inc. Method of preparing a wet coal seam for production in situ. 4,135,578, Cl. 166-245.000.

Texaco Development Corporation: *See*—
Zimmerman, Robert L.; and Klein, Howard P., 4,136,240, Cl. 521-115.000.

Texaco Inc.: *See*—
Dorawala, Tansukhlal G.; and Reinhard, Russell R., 4,136,129, Cl. 260-672.00R.
Pogonowski, Ivo C.; and Fowler, Joe R., 4,136,008, Cl. 210-83.000.

Texas Instruments Incorporated: *See*—
Manns, William G., 4,135,281, Cl. 29-25.140.

Th. Goldschmidt AG: *See*—
Rossmy, Gerd, 4,136,239, Cl. 521-111.000.

Th. Kieserling & Albrecht: *See*—
Weck, Karl-Gustav, 4,135,417, Cl. 82-20.000.

Thacker, Louis H.: *See*—
Pechin, William H.; Thacker, Louis H.; and Turner, Lloyd J., 4,135,821, Cl. 356-335.000.

Thatcher, Donald N.: *See*—
Goddard, Terrence P.; and Thatcher, Donald N., 4,135,956, Cl. 149-22.000.

Thate, Kurt; and Bruckl, Konrad, to AGFA-Gevaert AG. Sealing device. 4,135,698, Cl. 251-61.100.

Thayer, Helen I.: *See*—
Pellegrini, John P., Jr.; and Thayer, Helen I., 4,136,042, Cl. 252-46.700.

Theeuwes, Felix: *See*—
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,135,514, Cl. 128-260.000.

Theissen, Ferdinand: *See*—
Lussling, Theodor; Theissen, Ferdinand; and Weigert, Wolfgang, 4,136,108, Cl. 260-465.80R.

Theobald, Hans: *See*—
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,135,909, Cl. 71-86.000.

Thermatool Corporation: *See*—
Rudd, Wallace C., 4,136,272, Cl. 219-107.000.

Thermo-Lab Instruments, Inc.: *See*—
Capone, David M., 4,135,382, Cl. 73-23.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Rail grinding machine. 4,135,332, Cl. 51-5.00D.

Theurer, Josef; and Ollerer, Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Freight train. 4,135,631, Cl. 214-38.0CA.

Thiele, Carl L.: *See*—
United States of America, National Aeronautics and Space Administration; Berdahl, C. Martin; and Thiele, Carl L., 4,135,367, Cl. 60-641.000.

Thimm, Hans-Joachim: *See*—
Moller, Hinrich; and Thimm, Hans-Joachim, 4,136,165, Cl. 424-60.000.

Thiokol Corporation: *See*—
Jackle, William A.; Mazzeo, Michael P.; and Gillis, Marina N., 4,136,092, Cl. 528-60.000.

Thirion, Jacobus C.: *See*—
Malan, Johannes D.; and Thirion, Jacobus C., 4,135,521, Cl. 131-141.000.

Thomas, Andre. Method of extracting a hyperglycemic factor. 4,136,170, Cl. 424-95.000.

Thomas, John M. Rotary blender. 4,135,827, Cl. 366-141.000.

Thomas, Morton I., to Temco Products, Inc. Invalid walker apparatus. 4,135,535, Cl. 135-67.000.

Thomas, Paul W., to Polaroid Corporation. Transducer backup assembly for sound motion picture film handling cassette. 4,135,793, Cl. 352-27.000.

Thompson, Robert M., to Sun Ventures, Inc. Block copolymer of poly (oxa-amide) and polyamide. 4,136,133, Cl. 260-857.0TW.

Thomson-CSF: *See*—
Moutou, Paul C.; Gibeau, Pierre; and Duchemin, Jean-Pascal, 4,136,352, Cl. 357-22.000.

Thorn-Ericsson Telecommunications (Mfg.) Limited: *See*—
Williams, Ioan H., 4,136,263, Cl. 179-15.0AT.

Thyen, Eberhard H., to Ethicon, Inc. Package for armed sutures. 4,135,623, Cl. 206-63.300.

Tice, Richard P.; and Galbraith, Donald L. Muzzle charge storage and loading accessory for muzzle loading fire arms. 4,135,322, Cl. 42-90.000.

Tien, Ping K., to Bell Telephone Laboratories, Incorporated. Epitaxial growth of dissimilar materials. 4,136,350, Cl. 357-16.000.

Tien, Tseng Y.: *See*—
Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., 4,136,000, Cl. 204-195.00S.

Time & Temperature Company: *See*—
Maxwell, William H.; and Sines, Harvey J., 4,135,400, Cl. 73-343.500.

Times Mirror Company, The: *See*—
Darnall, John C., Jr., 4,136,150, Cl. 264-318.000.

Tischler, Edward J.: *See*—
Bakken, Daniel A.; Henderson, Robert A.; and Tischler, Edward J., 4,136,032, Cl. 210-278.000.

Tishevetskaya, Natalya V.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Tkachenko, Georgy P.: *See*—
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.

Tlaker, Erich; and Nichols, Clarence M., to Fellows Corporation. Control system for machine tool with hydraulically stroked cutter. 4,136,302, Cl. 318-39.000.

Tobacco Research & Development Institute Limited: *See*—
Malan, Johannes D.; and Thirion, Jacobus C., 4,135,521, Cl. 131-141.000.

Toda Kogyo Corp.: *See*—
Horiishi, Nanao; Takedoi, Atushi; Kondo, Hiroyuki; Sumita, Hiroshi; Mukaizaka, Akira; and Matsui, Goro, 4,136,049, Cl. 252-62.560.
Okuda, Yosiro; Horiishi, Nanao; Sumita, Hiroshi; and Harada, Tosiharu, 4,136,158, Cl. 423-632.000.

Toft, Anders S.: *See*—
Bogeso, Klaus P.; and Toft, Anders S., 4,136,193, Cl. 424-285.000.

Toivonen, Martti, to Rauma-Rapola Oy. Method for filtering a fibrous material by means of a disc filter as well as a disc filter for performing the method. 4,136,028, Cl. 210-73.00R.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Fukuda, Tsuguo, 4,135,963, Cl. 156-617.0SP.
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,135,491, Cl. 126-270.000.
Mitsutsuka, Norimasa; Kubo, Katsumi; and Miyazawa, Tatsuo, 4,135,970, Cl. 176-19.0LD.
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,136,292, Cl. 307-355.000.
Takamizawa, Kinya; and Iinuma, Kazuhiro, 4,136,325, Cl. 340-1.00R.

Tomasic, Nicholas A.: *See*—
Rosey, Richard; Kovatch, George N.; Tomasic, Nicholas A.; and Simon, Ned H., 4,136,374, Cl. 361-342.000.

Tominaga, Satoshi: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,135,876, Cl. 432-14.000.

Tompsett, Michael F., to Bell Telephone Laboratories, Incorporated. Semiconductor charge coupled device analog to digital converter. 4,136,335, Cl. 340-347.0AD.

Tong, Duncan, to Playart Limited. Aquatic figure toy. 4,135,326, Cl. 46-92.000.

Toray Industries, Inc.: *See*—
Okamoto, Miyoshi; and Yoshida, Syusuke, 4,136,221, Cl. 428-91.000.

Torelli, Vesperto: *See*—
Nedelec, Lucien; Torelli, Vesperto; and Fournex, Robert, 4,136,179, Cl. 424-242.000.

Toro Company, The: *See*—
Hunter, Edwin J.; Hunter, Richard E.; and Cudworth, Richard W., 4,135,539, Cl. 137-1.000.
Larsen, Glenn L., 4,135,724, Cl. 280-5.00R.

Torrington Company, The: *See*—
Benson, Carl F., 4,135,372, Cl. 64-17.0SP.

Toshiba House Living Industry Co., Ltd.: *See*—
Koizumi, Hisao; Kawada, Yoshinosuke; and Fujimura, Sadao, 4,135,491, Cl. 126-270.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Manabe, Takao; Machi, Shinji; and Matunaga, Sigetugu, 4,135,459, Cl. 112-121.120.
Sone, Tadatoshi; and Kayanuma, Kiyokazu, 4,135,873, Cl. 425-147.000.

Toth, Geza; and Toth, Istvan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. 2-(5-Nitro-furfurylidene)-amino-benzimidoles and fungicidal compositions containing the same. 4,136,189, Cl. 424-273.00R.

Toth, Imre, to Societe Metallurgique le Nickel-SLN. Process in the manufacture of steels containing nickel. 4,135,916, Cl. 75-60.000.

Toth, Istvan: *See*—
Toth, Geza; and Toth, Istvan, 4,136,189, Cl. 424-273.00R.

Touma, Teruo: *See*—
Tsukagoshi, Tsunehiro; Touma, Teruo; and Kimura, Masami, 4,135,601, Cl. 181-167.000.

Toyo Jozo Company, Ltd.: *See*—
Morishita, Masataka; Fukushima, Mitsuru; and Inaba, Yoshihito, 4,135,943, Cl. 106-209.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Ikuta, Shigeru; Horiuchi, Yoshifumi; Misaki, Hideo; Matsuura, Kazuo; Imamura, Shigeyuki; and Muto, Naoki, 4,135,980, Cl. 195-62.000.

Toyo Kogyo Co., Ltd.: *See*—
Sumida, Shizuo; Nii, Kazuo; Shimizu, Osamu; Ueda, Atsushi; and Ishii, Mitsuaki, 4,136,333, Cl. 340-147.00C.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Takahashi, Kenji; Seita, Toru; Asami, Shunichi; and Shimizu, Akihiko, 4,136,237, Cl. 521-27.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Fujii, Takashi; Nakamura, Hiroyuki; and Souma, Teruo, 4,135,635, Cl. 220-85.00B.
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,136,063, Cl. 252-466.00J.
Nakamura, Norihiko; Itou, Takaaki; and Kikuchi, Kazuo, 4,136,139, Cl. 261-44.00C.

Tracor, Inc.: *See*—
Wallace, David W., 4,135,455, Cl. 102-217.000.

Trane Company, The: *See*—
Stanke, Dennis A.; Rentmeester, Paul C.; and Ulland, Paul D., 4,135,396, Cl. 73-204.000.

Transaction Management, Inc.: *See*—
Hunter, Alexander, 4,135,676, Cl. 242-67.200.

Transportation Logic Corporation: *See*—
Trobert, Joseph F., 4,136,329, Cl. 340-52.00F.

Trautloff, Gary, to Henry's Machine Works. High performance axle assembly. 4,135,766, Cl. 301-114.000.

Travnicek, Edward A.: *See*—
Deeg, Emil W.; and Travnicek, Edward A., 4,135,792, Cl. 351-41.000.

Traynor, Sean G.: *See*—
Hirschy, Linda M.; Kane, Bernard J.; and Traynor, Sean G., 4,136,126, Cl. 260-666.00A.

Treadwell, Kenneth: *See*—
Hirshman, Justin L.; and Treadwell, Kenneth, 4,136,046, Cl. 252-182.000.

Trelleborg Rubber Company, Inc.: *See*—
Andersson, Sven E., 4,135,550, Cl. 137-565.000.

Trelleborgs Gummifabriks Aktiebolag: *See*—
Wincent, Alf G. R., 4,135,592, Cl. 180-19.00H.

Treplin, Friedrich-Wilhelm; and Borchert, Werner, to Ludwig Taprogge, Reinigungsanlagen fur Rohren-Warmeaustauscher. Device for recovering cleaning elements from a heat-exchanger stream. 4,135,574, Cl. 165-95.000.

Trindle, Terry L.: *See*—
Brown, Donald D.; and Trindle, Terry L., 4,135,607, Cl. 188-161.000.

Trio Kabushiki Kaisha: *See*—
Asahi, Nobumitsu, 4,136,260, Cl. 179-1.00G.
Ogi, Kenji; and Sakamoto, Masakatsu, 4,135,600, Cl. 181-156.000.

Trobert, Joseph F., to Transportation Logic Corporation. Engine condition-responsive shutdown and warning apparatus. 4,136,329, Cl. 340-52.00F.

Trombley, James, Jr.: *See*—
O'Halloran, William J.; and Trombley, James, Jr., 4,136,286, Cl. 307-57.000.

Trommsdorff, Wolf: *See*—
Prochnow, Jurgen; and Trommsdorff, Wolf, 4,135,449, Cl. 102-52.000.

Tsang, Wei K., to Analog Devices, Inc. IC chip with buried Zener diode. 4,136,349, Cl. 357-13.000.

TSD Kabushiki Kaisha: *See*—
Sugimoto, Yoshio, 4,135,670, Cl. 239-428.500.

Tseng, Ching Y.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,208, Cl. 426-538.000.

Tsernes, Vladimir; Y.: *See*—
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.

Tsukagoshi, Tsunehiro; Touma, Teruo; and Kimura, Masami, to Pioneer Electronic Corporation. Boron coated diaphragm for use in a loud speaker. 4,135,601, Cl. 181-167.000.

Tsukui, Norihiko: *See*—
Minami, Kazuto; Tsukui, Norihiko; and Imamoto, Tsunehiko, 4,136,224, Cl. 428-161.000.

Tsunekawa, Tokuichi: *See*—
Masunaga, Makoto; Hosoe, Kazuya; Tsunekawa, Tokuichi; Tamura, Shuichi; and Yokota, Hideo, 4,135,815, Cl. 356-4.000.

Tsuyuguchi, Michio: *See*—
Kiritani, Yoshio; and Tsuyuguchi, Michio, 4,135,983, Cl. 201-25.000.

Tsuzi, Shoichi; Aoki, Kiyoshi; Sakai, Takeshi; Ikebe, Hiroshige; and So, Dogi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Two stage combustion furnace. 4,135,874, Cl. 431-115.000.

Tulon, Inc.: *See*—
Hemmings, David T., 4,135,847, Cl. 408-226.000.

Turillon, Pierre P.; and Sandrock, Gary D., to International Nickel Company, Inc., The. Hydrogen storage module. 4,135,621, Cl. 206-0.700.

Turner, John W.: *See*—
Hughes, John J.; Lis, Theodore F.; Turner, John W.; and Bliss, Joseph P., 4,135,848, Cl. 408-239.00A.

Turner, Lloyd J.: *See*—
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Berger, Sidney E., 4,136,080, Cl. 260-40.00R.
Eang, Tan H.; McDonald, John O.; and Yi, Kenneth C., 4,135,560, Cl. 141-198.000.
Kamm, Gerard R.; Milks, David; Kearns, James D.; Britt, Herbert I.; and Khavarian, Cyrus R., 4,136,015, Cl. 208-129.000.
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Senger, Gerhard F.; and Poque, Dionysius J., 4,135,566, Cl. 152-361.0FP.
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Wilson, Martin, 4,136,019, Cl. 209-166.000.
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Agriculture: *See—*
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Fritts, David H., 4,136,234, Cl. 429-178.000.
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Brown, Robert L., 4,135,294, Cl. 29-605.000.
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Young, William R.; and Stump, Charles W., 4,135,817, Cl. 356-28.000.
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Griffith, James R.; and O'Rear, Jacques G., 4,136,107, Cl. 260-465.00E.
Kinsey, Lloyd E.; and Roush, Gregory C., 4,135,452, Cl. 102-214.000.
Morris, Joseph W.; and Marchese, Vincent P., 4,135,454, Cl. 102-205.000.
Murray, Kenneth M., 4,136,281, Cl. 250-336.000.
Stregack, Joseph A.; and Manuccia, Thomas J., 4,136,317, Cl. 331-94.50G.
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Alcock, Robert N.; Lucas, David A.; and Vincent, Richard P., 4,136,342, Cl. 343-113.00R.
Camerik, Eduard, 4,135,721, Cl. 274-1.00D.
Eggermont, Ludwig D. J., 4,136,398, Cl. 364-724.000.
Lindquist, Thomas R., 4,136,388, Cl. 364-414.000.
Verspui, Gerrit, 4,136,006, Cl. 204-290.00F.
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Dean, Lee W., III; and Peracchio, Aldo A., 4,135,603, Cl. 181-286.000.
Jalan, Vinod M.; and Bushnell, Calvin L., 4,136,059, Cl. 252-447.000.
McLafferty, George H., 4,135,787, Cl. 350-294.000.
Packman, Allan B., 4,135,363, Cl. 60-262.000.
Paunone, John L.; and Smakula, Fritz K., 4,135,857, Cl. 416-193.00A.
Slaughter, Edward R., 4,136,231, Cl. 428-609.000.
Wright, Robert J.; Hecht, Ralph J.; and Fenton, Richard J., 4,135,286, Cl. 29-420.000.
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Ragard, Phillip A.; and Matson, Crawford A., 4,135,558, Cl. 140-105.000.
Snyder, Michael D.; and Bates, Erwin F., 4,135,630, Cl. 214-1.0BT.
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Dreyfuss, Patricia; and Kennedy, Joseph P., 4,136,136, Cl. 260-878.00R.
University of Minnesota, The Regents of the: *See—*
Condie, Richard M., 4,136,094, Cl. 260-122.000.
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Mori, Shuji, 4,135,889, Cl. 48-73.000.
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UOP Inc.: *See—*
Antos, George J., 4,136,017, Cl. 208-139.000.
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Hayes, John C.; and Pollitzer, Ernest L., 4,136,064, Cl. 252-466.00B.
Kuchar, Paul J., 4,135,886, Cl. 422-216.000.
Stauter, John C., 4,135,997, Cl. 204-117.000.
Um, Richard T., 4,135,993, Cl. 204-66.000.
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Bundy, Gordon L., 4,136,095, Cl. 546-112.000.
De Boer, Clarence; Dolak, Lester A.; and Peterson, Durey H., 4,136,171, Cl. 424-117.000.
Morozowich, Walter, 4,136,115, Cl. 260-559.00R.
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Urquhart, William J., to F.B.J. Engineering Services Pty, Ltd. Piston rod seal. 4,135,723, Cl. 277-203.000.
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Westlund, Kenneth P.; and Kirwan, Patrick N., 4,136,306, Cl. 318-568.000.
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Van de Kerkof, Herman. Bee hive. 4,135,265, Cl. 6-1.000.
Vandenberg, Ervin K., to Westran Corporation. Valve actuator fastener. 4,135,838, Cl. 403-316.000.
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Stegenga, Philip D.; and Vandenbrink, Wayne, 4,135,694, Cl. 248-478.000.
van der Burg, Sjirk, to Uniroyal GmbH. Recapped pneumatic tire. 4,135,565, Cl. 152-361.00R.
van Goolen, Jacobus T. J.: *See—*
Bakx, Cornelis A. C. L.; van Goolen, Jacobus T. J.; Jansen, Jacobus; and Kuiper, Hubertus G., 4,135,881, Cl. 23-230.0PC.
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van Nederkassel, Ludovicus J., to Atlas Copco Aktiebolag. Method and device for controlling the pressure of a working medium delivered by a compressor. 4,135,860, Cl. 417-12.000.
Van Remoortel, John G., to Du Pont de Nemours, E. I., and Company. Snap-fitting. 4,135,773, Cl. 308-238.000.
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Varian Associates, Inc.: *See—*
Govignon, Jacques P., 4,135,791, Cl. 351-7.000.
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Moulin, Michele; Escher, Balint; Prince, Dominique; and Vasseux, Jean, 4,135,990, Cl. 204-32.00R.
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Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,136,187, Cl. 424-266.000.
VEB Pentacon Dresden Kamera und Kinowerke: *See—*
Reimann, Hubertus; Hahn, Werner; and Welzel, Herbert, 4,135,799, Cl. 354-147.000.
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Bier, Peter; Binsack, Rudolf; and Vernaleken, Hugo, 4,136,089, Cl. 528-309.000.

Verspui, Gerrit, to U.S. Philips Corporation. Electrode for electrochemical machining. 4,136,006, Cl. 204-290.00F.

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Young, Sheldon E., 4,135,392, Cl. 73-141.00A.

Vicard, Jean-Francois, to Societe Lab. Process and apparatus for the treatment of liquids containing solid particles. 4,135,965, Cl. 159-4.0CC.

Vin-Tex Sealers Inc.: *See—*
Voller, Ronald L., 4,135,957, Cl. 156-157.000.

Vinals, Joaquin: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Schuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,136,120, Cl. 260-586.00G.
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Light, Kenneth K.; Spencer, Bette M.; Vinals, Joaquin F.; Kiwala, Jacob; Vock, Manfred H.; and Shuster, Edward J., 4,135,520, Cl. 131-17.00R.

Vincent, Richard P.: *See—*
Alcock, Robert N.; Lucas, David A.; and Vincent, Richard P., 4,136,342, Cl. 343-113.00R.

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Bogese, Stephen B., II, 4,135,336, Cl. 52-147.000.

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Voegeli, Ronald C. Locking mechanism for cabinet enclosure. 4,135,375, Cl. 70-77.000.

Vogel, John D., to Cummins Engine Company, Inc. Fuel consumption rate indicating system for a vehicle. 4,136,389, Cl. 364-442.000.

Voith Getriebe KG: *See—*
Stodt, Enno, 4,135,772, Cl. 308-227.000.

Volbeda, Johan H., to Hollandsche Aanneming Maatschappij B.V. Tooth positioning arrangement for an underwater soil cutting head. 4,135,318, Cl. 37-67.000.

Volgenau, Lewis: *See—*
Jones, Robert L.; Volgenau, Lewis; and Davis, Philip S., 4,136,152, Cl. 423-242.000.

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Heitland, Herbert; Grundmann, Edgard; and Kroll, Rudolf, 4,135,492, Cl. 126-271.000.
Mohr, Paul; and Pokowitz, Wolf D., 4,135,368, Cl. 62-133.000.

Voller, Ronald L., to Vin-Tex Sealers Inc. Method for sealing plastic sheets. 4,135,957, Cl. 156-157.000.

von Basse, Paul-Werner, to Siemens Aktiengesellschaft. Storage module. 4,136,401, Cl. 365-208.000.

von der Eltz, Hans-Ulrich; and Glander, Siegfried, to Hoechst Aktiengesellschaft. Process for the uniform dyeing of textile wound packages or packaged material. 4,135,268, Cl. 8-155.100.

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Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.

Vuletic, Bogdan; and Klingelhofer, Hans-Jurgen, to Korf Engineering GmbH. Process for the direct reduction of metallic oxides. 4,135,914, Cl. 75-34.000.

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Quattlebaum, Robert W., 4,136,205, Cl. 426-412.000.

Wada, Tasaku, to Kokusai Denshin Denwa Kabushiki Kaisha. Automatic answering device in facsimile. 4,136,261, Cl. 179-2.00R.

Wade, Peter C.: *See—*
Haugwitz, Rudiger D.; and Wade, Peter C., 4,136,174, Cl. 424-184.000.

Wager, Leonard R.: *See—*
Davies, Robert W.; and Wager, Leonard R., 4,135,617, Cl. 198-458.000.

Wagner, Gary L. Drill rig-casing driver assembly. 4,135,585, Cl. 173-49.000.

Wagner, Robert L., to Schreves, Inc. Boring and compacting tool. 4,135,588, Cl. 175-19.000.

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Wakamatsu, Hisato; and Yazawa, Akio, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Thermocouple temperature detecting assembly. 4,135,402, Cl. 73-361.000.

Waldron, Wesley K., to General Electric Company. Capacitive touchpad devices with dynamic bias. 4,136,291, Cl. 307-308.000.

Wallace, Clarence W.; and Koenig, Howard A., to Standard Oil Company (Indiana). Machine for producing additive containing plastic articles. 4,135,870, Cl. 425-130.000.

Wallace, David W., to Tracor, Inc. Multiple payload cartridge employing single pair of electrical connections. 4,135,455, Cl. 102-217.000.

Walliczek, Erwin G., to ICI Australia Limited. Fungicidal composition and method of use. 4,136,172, Cl. 424-141.000.

Waltenberger, Peter: *See—*
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Walter, Karl, to AGFA-Gevaert AG. Method and system for automatically matching the format of the projected image of an original to the format of the copying material. 4,135,810, Cl. 355-29.000.

Walter Kidde & Company, Inc.: *See—*
Willey, Clair L., 4,135,684, Cl. 243-19.000.

Waltrip, Owen R., to Nuclear Supreme. Enriched fuel making and sewage treating process. 4,135,888, Cl. 44-1.00D.

Wandl, Rudolf H., to Kurt Vogelsang GmbH. Spray can safety cap. 4,135,638, Cl. 220-284.000.

Wang, Richard H. S.: *See—*
Irick, Gether, Jr.; and Wang, Richard H. S., 4,136,083, Cl. 252-400.00A.

Warczak, Russell C., to Cedco, Inc. Pneumatic shafts, chucks and lifts for roll stock. 4,135,677, Cl. 242-72.00B.

Ward, Charles A. Load body for a pickup truck. 4,135,761, Cl. 296-37.600.

Ward, Elmer E.: *See—*
Joseph, A. David; and Ward, Elmer E., 4,136,011, Cl. 210-168.000.

Warnant, Julien; Prost-Marechal, Jacques; and Cosquer, Philippe, to Roussel Uclaf. Insecticidal cyclopropane carboxylates. 4,136,195, Cl. 424-304.000.

Warner-Lehman Corporation: *See—*
Lehman, James A., 4,135,325, Cl. 46-74.00D.

Warren, Bruce J., to A. O. Smith Harvestore Products, Inc. Self-adjusting breather bag. 4,135,443, Cl. 99-646.00S.

Watanabe, Keiji: *See—*
Saito, Masato; Watanabe, Keiji; and Fukuyama, Keiji, 4,136,227, Cl. 428-389.000.

Watanabe, Tugio: *See—*
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Watanabe, Yoshiaki: *See—*
Sunouchi, Akio; Kozuki, Susumu; and Watanabe, Yoshiaki, 4,135,801, Cl. 354-214.000.

Watanabe, Yoshifumi: *See—*
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Watkins, Bruce J., to Regan Offshore International, Inc. Mud flow heave compensator. 4,135,841, Cl. 405-196.000.

Watkins, John H., to Southern California Edison Company. Method of determining the location of underwater pipeline leaks. 4,135,385, Cl. 73-40.50R.

Watson, Hugh R.; Rowsell, David G.; and Spring, David J., to Wilkinson Sword Limited. p-Menthane carboxamides having a physiological cooling effect. 4,136,163, Cl. 424-54.000.

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Weck, Karl-Gustav, to Th. Kieserling & Albrecht. Infeed device for a turning machine for finishing the peripheral surfaces of elongated workpieces of cylindrical cross-section. 4,135,417, Cl. 82-20.000.

Wegmuller, Hans: *See—*
Jager, Horst; and Wegmuller, Hans, 4,136,039, Cl. 252-8.800.

Weibel, Michael K.: *See—*
Spina, Joseph; and Weibel, Michael K., 4,135,516, Cl. 128-303.00R.

Weidanz, Herbert; and Auf Dem Graben, Horst. Cassette for stack of single films. 4,135,800, Cl. 354-174.000.

Weidler, Charles H., to AMP Incorporated. Spring switch for mounting on a circuit board substrate. 4,136,269, Cl. 200-67.00D.

Weigert, Frank J., to Du Pont de Nemours, E. I., and Company. Production of HCN from organic nitriles. 4,136,156, Cl. 423-372.000.

Weigert, Wolfgang: *See—*
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Weiner, Lewis. Method and apparatus for assembling slide fastener sliders. 4,135,285, Cl. 29-409.000.

Welch, Cletus N., to PPG Industries, Inc. Method of electrolysis, and electrode for the electrolysis. 4,135,995, Cl. 204-98.000.

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Welsh, Patrick G., to Pullman Incorporated. Powered railway car steering assembly. 4,135,456, Cl. 105-135.000.

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Kaczmarek, Thomas D.; and Wengrzyn, Richard J., 4,135,399, Cl. 73-339.00R.
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Hurlemann, Ernst; and Bosshard, Werner, 4,135,434, Cl. 89-181.000.
Wernet, William F.; and Anders, Raymond H., to GTE Automatic Electric Laboratories Incorporated. Actuator for pushbutton switch. 4,136,270, Cl. 200-340.000.
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Oehrle, Robert C., 4,135,902, Cl. 65-2.000.
Westinghouse Air Brake Company: *See*—
Kuhn, John J., 4,136,315, Cl. 331-46.000.
Westinghouse Electric Corp.: *See*—
Benedict, Robert P., 4,135,387, Cl. 73-53.000.
Binstock, Morton H.; and Stern, Bertram H., 4,135,854, Cl. 416-37.000.
England, Forrest E., 4,135,688, Cl. 248-604.000.
Fox, Richard Q., 4,136,393, Cl. 364-492.000.
Garkisch, Hans D.; Yant, Howard W.; and Patterson, John F., 4,135,974, Cl. 176-87.000.
Glenn, Robert G., 4,135,362, Cl. 60-39.16R.
Kaczmarek, Thomas D.; and Wengrzyn, Richard J., 4,135,399, Cl. 73-339.00R.
Kuhn, Edmund W., 4,136,339, Cl. 340-638.000.
LeBreton, Albert F., 4,135,401, Cl. 73-351.000.
Light, Stanley C., Jr.; and Privoznik, Louis J., 4,135,701, Cl. 266-57.000.
Luo, Fang-Chen; and Brody, Thomas P., 4,135,959, Cl. 156-230.000.
Mendolia, Frank J., 4,135,552, Cl. 138-30.000.
Neff, Edward C.; and Spicer, Howard F., 4,135,282, Cl. 29-157.30A.
Pigott, Ronald, 4,135,849, Cl. 415-119.000.
Rosey, Richard; Kovatch, George N.; Tomasic, Nicholas A.; and Simon, Ned H., 4,136,374, Cl. 361-342.000.
Salon, Sheppard J.; and Montgomery, Lon W., 4,136,312, Cl. 324-51.000.
Westlin, Karl; and Rose, Charles E., to American Air Filter Company, Inc. Gas filter device. 4,135,900, Cl. 55-499.000.
Westlund, Kenneth P.; and Kirwan, Patrick N., to USM Corporation. Apparatus for preparing pattern control tapes. 4,136,306, Cl. 318-568.000.
Westphal, Bruce D.; and Berardi, Jim A., to Honeywell Inc. Load cycling with space temperature feedback. 4,136,392, Cl. 364-492.000.
Westran Corporation: *See*—
Vandenberg, Ervin K., 4,135,838, Cl. 403-316.000.
Weyerhaeuser Company: *See*—
Dehaas, Gerrit G., 4,135,968, Cl. 162-30.00R.
Wharton Shipping Corporation: *See*—
Kirby, William E.; and Seymour, David J., 4,135,468, Cl. 114-260.000.
Wheeler, Ian R., to Ciba-Geigy Corporation. Pigment composition. 4,135,944, Cl. 106-288.00Q.
Wheeler, John P., to Carboline Company. Method of applying fire-proofing material to elongate structural member. 4,136,147, Cl. 264-261.000.
Whirlpool Corporation: *See*—
Braga, Albert T.; Brenner, Robert A.; and Cuthbert, Victor W., 4,135,258, Cl. 4-187.00A.
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, to Hesston Corporation. Apparatus for loading and baling crop material. 4,135,444, Cl. 100-50.000.
White, Barry F., to Summit Packaging Systems, Inc. Metering valve for pressurized dispensing containers. 4,135,648, Cl. 222-402.200.
White, James F.; and Rege, James R., to Standard Oil Company, The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,136,110, Cl. 562-532.000.
White, James F.: *See*—
Gniewek, John J.; Reith, Timothy M.; Sullivan, Michael J.; and White, James F., 4,135,998, Cl. 204-192.00E.
White, Stanley A.: *See*—
Kephart, Gerald W.; and White, Stanley A., 4,136,287, Cl. 307-221.00D.
White, Steven A.: *See*—
Rogan, John B.; and White, Steven A., 4,136,047, Cl. 252-56.00R.
Whitehurst, Darrell D., to Mobil Oil Corporation. Sorbent for heavy metals. 4,136,021, Cl. 208-251.00R.
Widmer, Peter. Method of and apparatus for aerobic decomposition of organic solids. 4,135,908, Cl. 71-9.000.
Wiesmann, Herbert L. Folding leg assembly. 4,135,691, Cl. 248-188.600.
Wild, Albrecht: *See*—
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,136,200, Cl. 424-341.000.
Wild, Gerald K.: *See*—
Chesla, Frank J.; and Wild, Gerald K., 4,135,472, Cl. 116-124.00R.
Wilhelmstal-Werke GmbH: *See*—
Kuckhermann, Gustav, 4,135,618, Cl. 198-471.000.
Wilkinson Sword Limited: *See*—
Rowsell, David G.; and Hems, Roger, 4,136,164, Cl. 424-54.000.
Watson, Hugh R.; Rowsell, David G.; and Spring, David J., 4,136,163, Cl. 424-54.000.
Willer, Robert A.: *See*—
Shuppert, Laurence V.; Hanson, William D.; and Willer, Robert A., 4,135,960, Cl. 156-240.000.
Willey, Clair L., to Walter Kidde & Company, Inc. Single tube pneumatic banking system. 4,135,684, Cl. 243-19.000.
Wm. R. Stewart & Sons (Hacklemakers) Ltd.: *See*—
Stewart, William R., 4,135,355, Cl. 57-58.910.
Williams, Frank J., III; and Donahue, Paul E., to General Electric Company. Method for making aromatic cyclic polyformals. 4,136,087, Cl. 528-219.000.
Williams, Geoffrey A.; and Green, Keith R., to Dunlop Limited. Anti-skid system incorporating means for controlling the rate of re-application of brake pressure. 4,135,769, Cl. 303-106.000.
Williams, Ioan H., to Thorn-Ericsson Telecommunications (Mfg.) Limited. Telephone system having space divided speech channels and a separate time divided data highway. 4,136,263, Cl. 179-15.0AT.
Williams, James A. Toilet paper roll dispenser and holder. 4,135,678, Cl. 242-55.300.
Williams, Ralph P.; and Howard, William S., to Phillips Petroleum Company. Reaction product of olefinically-unsaturated nitrile and a monoolefinic hydrocarbon as plasticizer for conjugated diene-unsaturated nitrile rubber. 4,136,077, Cl. 260-32.400.
Willis, Robert A., to Hestair Stanhay Limited. Seed drilling units. 4,135,457, Cl. 111-52.000.
Willis, Wilburn C. Tip members for crutches and the like. 4,135,536, Cl. 135-84.000.
Willis, William J.: *See*—
Canaris, Valerie M.; and Willis, William J., 4,135,991, Cl. 204-43.00S.
Wilson Industries, Inc.: *See*—
Nelson, Paul M.; and Hutchinson, Carl P., 4,135,577, Cl. 166-241.000.
Wilson, Leonard T.: *See*—
Falkowski, Frank J.; and Wilson, Leonard T., 4,136,161, Cl. 424-3.000.
Wilson, Martin, to United States Borax & Chemical Corp. Production of high purity fluorspar and barite concentrates from a complex fluorspar ore. 4,136,019, Cl. 209-166.000.
Wincent, Alf G. R., to Trelleborgs Gummifabriks Aktiebolag. Four-wheel-drive articulated frame steering vehicle. 4,135,592, Cl. 180-19.00H.
Winkler, Lyle D., to Reliance Glass Works. Laboratory glassware taper connector system with retainer and backup seal. 4,135,866, Cl. 422-103.000.
Winkler, Robert J.; Harris, Colin G.; and Sprague, Terry A., to Alpha Nova Development Corp. Soaker hose support. 4,135,668, Cl. 239-276.000.
Winship, Bruce A.: *See*—
Schoppe, Wayne F.; and Winship, Bruce A., 4,135,804, Cl. 355-3.0SH.
Winstead, Maynard R.: *See*—
Finn, William M.; Peck, Michael C.; and Winstead, Maynard R., 4,136,075, Cl. 260-29.6TA.
Witt, Donald R.: *See*—
Hogan, John P.; and Witt, Donald R., 4,136,061, Cl. 252-458.000.
Wodehouse, Richard A.: *See*—
Meyer, Raymond J.; Johnson, Wayne F.; and Wodehouse, Richard A., 4,136,026, Cl. 210-45.000.
Wolfe, Richard B.: *See*—
Evans, Joseph H.; and Wolfe, Richard B., 4,135,553, Cl. 138-141.000.
Wolfe, Roger L.: *See*—
Harris, Rudy M.; Wolfe, Roger L.; and Martin, William T., 4,135,628, Cl. 212-14.000.
Wolstencroft, Michael J., to Du Pont of Canada Limited. Friction false twister. 4,135,356, Cl. 57-343.000.
Wood, Eric, to Insituform International Inc. Method of lining a passageway with a resin absorbent tube. 4,135,958, Cl. 156-199.000.
Wood, John R.: *See*—
Karnis, Alkibiadis; and Wood, John R., 4,135,389, Cl. 73-61.400.
Woodard, Roland L., Jr.: *See*—
Jones, Joseph; Pang, Steven J.; and Woodard, Roland L., Jr., 4,136,394, Cl. 364-561.000.
Woodruff, Phillip R.: *See*—
Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., 4,136,000, Cl. 204-195.00S.
Woods, William B.: *See*—
Buono, Frederick J.; and Woods, William B., 4,135,945, Cl. 106-308.00N.
Woodward Governor Company: *See*—
O'Halloran, William J.; and Trombley, James, Jr., 4,136,286, Cl. 307-57.000.
Wooldridge, Darrel; and McKinnon, Eugene T., to Gem Products, Inc. Combination knob and dial control for cold control devices. 4,135,471, Cl. 116-366.000.
Workman, Harold W., to Rockwell International Corporation. Transition encoding apparatus. 4,136,258, Cl. 178-68.000.
Wormser, Alex F.; and Perkins, Stephen P., to Wormser Engineering, Inc. Burning and desulfurizing coal. 4,135,885, Cl. 422-142.000.
Wormser Engineering, Inc.: *See*—
Wormser, Alex F.; and Perkins, Stephen P., 4,135,885, Cl. 422-142.000.
Worrall, Roy, to Monsanto Limited (Monsanto Chemicals Ltd.). Moldable foamed polymer composition and a process therefor. 4,136,140, Cl. 264-42.000.

Wozniak, Stephen G., to Apple Computer, Inc. Microcomputer for use with video display. 4,136,359, Cl. 358-17.000.
Wright, Robert J.; Hecht, Ralph J.; and Fenton, Richard J., to United Technologies Corporation. Sputtering target fabrication method. 4,135,286, Cl. 29-420.000.
Wurtz, Marguerite E.: *See—*
Feit, Eugene D.; and Wurtz, Marguerite E., 4,136,225, Cl. 428-201.000.
Xerox Corporation: *See—*
Belli, Frank G., 4,135,926, Cl. 96-1.0PS.
Draugelis, Vaidevutis C.; Hartman, William R., Jr.; and Langdon, Michael J., 4,135,927, Cl. 96-1.200.
Forward, John E.; Muller, George A.; and Connolly, Douglas P., 4,135,642, Cl. 222-23.000.
Gerrard, James A., 4,136,277, Cl. 250-205.000.
Kingsland, David O., 4,135,812, Cl. 355-51.000.
Saran, Amitabh, 4,136,363, Cl. 358-261.000.
Schoppe, Wayne F.; and Winship, Bruce A., 4,135,804, Cl. 355-3.0SH.
Taylor, Thomas N.; and Mahler, Charles J., 4,135,805, Cl. 355-3.00R.
Wells, John B., 4,135,925, Cl. 96-1.0PE.
Yajima, Kenji. Electronic timepiece with the amending means. 4,135,359, Cl. 58-85.500.
Yamamoto, Masanobu: *See—*
Naruse, Yohsuke; Yamamoto, Masanobu; and Sugiki, Mikio, 4,136,362, Cl. 358-128.000.
Yamamoto, Takeshi. Pre-recorded magnetic audio tape for study. 4,135,314, Cl. 35-8.00A.
Yamane, Mituo: *See—*
Sakamoto, Yusuke; Kinugasa, Munetaka; Endo, Shigeki; Yamane, Mituo; and Fujie, Shigeyoshi, 4,136,027, Cl. 210-63.00Z.
Yamasaki, Toshio, to Mattel, Inc. Clutch mechanism for a toy vehicle. 4,135,328, Cl. 46-202.000.
Yamazaki, Kiyoichi: *See—*
Muro, Kakuro; Yashiro, Kuniji; Kaneko, Hideaki; and Yamazaki, Kiyoichi, 4,136,073, Cl. 260-29.2EP.
Yanagisawa, Kazuhisa: *See—*
Nishikawa, Masaji; Sato, Eiichi; and Yanagisawa, Kazuhisa, 4,135,811, Cl. 355-3.0SC.
Yano, Nobumitsu; Fukinbara, Itaru; and Takano, Mitsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Extraction method for odor and flavor producing ingredients of foods and flowers and products produced. 4,136,065, Cl. 252-522.000.
Yant, Howard W.: *See—*
Garkisch, Hans D.; Yant, Howard W.; and Patterson, John F., 4,135,974, Cl. 176-87.000.
Yashiro, Kuniji: *See—*
Muro, Kakuro; Yashiro, Kuniji; Kaneko, Hideaki; and Yamazaki, Kiyoichi, 4,136,073, Cl. 260-29.2EP.
Yastrebova, Tatyana D.: *See—*
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.
Yasumoto, Seiichi: *See—*
Okada, Masakazu; Ide, Jushi; Yasumoto, Seiichi; and Fushimi, Hitoshi, 4,136,384, Cl. 364-200.000.
Yatcilla, George: *See—*
White, Allen A.; Case, Cecil L.; Ankenman, Thomas W.; and Yatcilla, George, 4,135,444, Cl. 100-50.000.
Yazaki Sogyo Kabushiki Kaisha: *See—*
Fukuyo, Junji; Kanbe, Chiharu; Ohike, Yasuaki; and Oguri, Tuneji, 4,135,405, Cl. 73-499.000.
Yazawa, Akio: *See—*
Wakamatsu, Hisato; and Yazawa, Akio, 4,135,402, Cl. 73-361.000.
Yi, Kenneth C.: *See—*
Eang, Tan H.; McDonald, John O.; and Yi, Kenneth C., 4,135,560, Cl. 141-198.000.
Yip Hing Camping Goods Manufactury Limited: *See—*
Chu, Cheuk S., 4,135,654, Cl. 224-25.00A.
Yokota, Hideo: *See—*
Masunaga, Makoto; Hosoe, Kazuya; Tsunekawa, Tokuichi; Tamura, Shuichi; and Yokota, Hideo, 4,135,815, Cl. 356-4.000.
Yokoyama, Takao: *See—*
Furihata, Makoto; Minamihata, Shigeaki; and Yokoyama, Takao, 4,136,289, Cl. 307-262.000.
Yoneyama, Masakazu; Fuseya, Yoshiharu; Kato, Norihiko; Sasaoka, Senzo; and Ishiguro, Shoji, to Fuji Photo Film Co., Ltd. Method of image formation. 4,135,931, Cl. 96-66.300.
Yoshida, Minoru: *See—*
Uchida, Shinya; Moriyama, Sinai; and Yoshida, Minoru, 4,135,709, Cl. 271-95.000.
Yoshida, Syusuke: *See—*
Okamoto, Miyoshi; and Yoshida, Syusuke, 4,136,221, Cl. 428-91.000.
Yoshizaki, Mineo, to Hitachi, Ltd. Private automatic branch exchange having two exchange units. 4,136,264, Cl. 179-18.0AD.
Yoshizawa, Tadao; and Sakaguchi, Masayuki, to Kubota, Ltd. Method of molding a socket part on a synthetic resinous pipe end. 4,135,961, Cl. 156-242.000.
Young, Ching T.: *See—*
Davis, Donald C.; Romine, Donald J.; Woodruff, Phillip R.; Bode, James D.; Tien, Tseng Y.; and Young, Ching T., 4,136,000, Cl. 204-195.00S.
Young, Sheldon E., to Vibro/Dynamics Corporation. Equipment mounting and monitoring system. 4,135,392, Cl. 73-141.00A.
Young, William R.; and Stump, Charles W., to United States of America, National Aeronautics and Space Administration. Apparatus for measuring an aircraft's speed and height. 4,135,817, Cl. 356-28.000.
Yuda, Takuo: *See—*
Taniai, Tadayoshi; and Yuda, Takuo, 4,135,277, Cl. 24-73.0PC.
Yunick, Smokey A. Racing type sulky. 4,135,730, Cl. 280-65.000.
Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, to Alza Corporation. Osmotic releasing system for administering ophthalmic drug to eye of animal. 4,135,514, Cl. 128-260.000.
Zamechnik, Frants F.: *See—*
Barbakadze, Dzhondo F.; Zamechnik, Frants F.; Popov, Vladimir F.; and Bykov, Pavel A., 4,135,920, Cl. 75-130.00R.
Zatulovsky, Isaak A.: *See—*
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Zazubin, Arkady I.: *See—*
Badaliants, Khoren A.; Belsky, Arkady A.; Butorin, Leonid M.; Danilina, Anna E.; Eljutin, Alexandr V.; Zatulovsky, Isaak A.; Zazubin, Arkady I.; Ivanova, Raisa V.; Isakov, Evgeny A.; Kostin, Ivan M.; Kunaev, Askar M.; Milberger, Teodor G.; Minin, Petr F.; Novikov, Nikolai A.; Ostapenko, Tatyana D.; Peredereev, Alexandr V.; Peikarov, Garegin A.; Romanov, Gennady A.; Simanova, Anatolia T.; Tishevetskaya, Natalya V.; Tkachenko, Georgy P.; Shalavina, Elena S.; Finkelshtein, Leonid I.; and Shmorgunenko, Nikolai S., 4,135,917, Cl. 75-109.000.
Zeeh, Bernd: *See—*
Jung, Johann; Kiehs, Karl; Zeeh, Bernd; and Theobald, Hans, 4,135,909, Cl. 71-86.000.
Zelvinsky, Semen M.: *See—*
Girshovich, Igor I.; Pripadchev, Vadim Y.; Tsernes, Vladimir; Y.; Bagryantsev, Valery I.; Berdnik, Valery V.; Kershenbaum, Naum Y.; Petrakov, Jury B.; Zelvinsky, Semen M.; and Yastrebova, Tatyana D., 4,135,685, Cl. 243-38.000.
Zielke, Clyde W., to Continental Oil Company; and United States of America, Energy. Regeneration of zinc chloride hydrocracking catalyst. 4,136,056, Cl. 252-415.000.
Zimin, Vladimir M.: *See—*
Kamarian, Georgy M.; Kostandov, Leonid A.; and Zimin, Vladimir M., 4,136,004, Cl. 204-256.000.
Zimmerman, Robert L.; and Klein, Howard P., to Texaco Development Corporation. Metallic quaternary ammonium carboxylates as polyisocyanurate catalysts. 4,136,240, Cl. 521-115.000.
Zinke-Allmang, Helmut; and Scheidmeir, Walter, to BASF Aktiengesellschaft. Manufacture of dialkyl-ketals. 4,136,124, Cl. 568-591.000.
ZNIKHBI:Tsentralny Nauchne:issledevatelsky institut khlopehatobumezhnoi promyshlennesti: *See—*
Santucci, Nicola; Aleksandrovic, Zabotin A.; Dmitrievich, Loschilin E.; Lvovich, Galperin A.; Archakovich, Onikov E.; Aleksandrovic, Sakharov B.; and Alekseevich, Borodin V., 4,135,556, Cl. 139-436.000.
Zwack, Robert R.; and Christenson, Roger M., to PPG Industries, Inc. Method of cleaning membrane filter. 4,136,025, Cl. 210-23.00H.
Zwarts, Johan M. C.: *See—*
Mulder, Willem; Bouman, Antonius F. M.; and Zwarts, Johan M. C., 4,136,341, Cl. 343-17.2PC.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fox, Austin L.; and Jones, William A. A., to Molins Limited. Box or packet for cigarettes. Re. 29,887, Cl. 229-44.0CB.

Jones, William A. A.: *See*—
Fox, Austin L.; and Jones, William A. A., Re. 29,887, Cl. 229-44.0CB.

Kaplan, Ervin. System for whole body imaging and count profiling with a scintillation camera. Re. 29,888, Cl. 250-363.00S.

Molins Limited: *See*—
Fox, Austin L.; and Jones, William A. A., Re. 29,887, Cl. 229-44.0CB.

LIST OF PLANT PATENTEES

F. Harmon Saville Nor'East Miniature Roses: *See*—
Schwartz, Ernest, deceased, 4,369, Cl. 10.000.

Ryan, John J. Impatiens plant. 4,371, 1-23-79, Cl. 69.000.

Schwartz, Ernest, deceased (by Schwartz, Hazel E., executrix), to F. Harmon Saville Nor'East Miniature Roses. Rose plant. 4,369, 1-23-79, Cl. 10.000.

Schwartz, Hazel E., executrix: *See*—
Schwartz, Ernest, deceased, 4,369, Cl. 10.000.

Van Well Nursery: *See*—
Van Well, Peter J., 4,370, Cl. 43.000.

Van Well, Peter J., to Van Well Nursery. Compact peach tree. 4,370, 1-23-79, Cl. 43.000.

LIST OF DESIGN PATENTEES

Appel, Mel. Toy vehicle. 250,907, 1-23-79, Cl. D34-15.0AJ.

Appel, Mel. Toy automobile. 250,908, 1-23-79, Cl. D34-15.0AJ.

Artiano, Aldo A., to Stanley Home Products, Inc. Brush. 250,859, 1-23-79, Cl. D4-09.000.

Ball Corporation: *See*—
Stahel, Alwin J., 250,870, Cl. D7-76.000.

Beatrice Foods Co.: *See*—
Koziol, Walter, 250,913, Cl. D48-36.000.

Beleckis, Vytautas K., to Ronson Corporation. Cigarette lighter. 250,899, 1-23-79, Cl. D27-42.000.

Bell Telephone Laboratories, Incorporated: *See*—
Stokes, Rembert R., 250,890, Cl. D14-53.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Portable typewriting machine. 250,914, 1-23-79, Cl. D18-1.000.

Berti, Enzo, to Magis S.R.L. Mobile adjustable table. 250,863, 1-23-79, Cl. D6-25.000.

Boelter, Frederick W. Pitcher. 250,869, 1-23-79, Cl. D7-64.000.

Boudreau, Robert J.; and Cunard, Joel C., to Hedstrom Co. Child's swing. 250,861, 1-23-79, Cl. D6-10.000.

Bowden, Tommye C. Bell beaded figure. 250,903, 1-23-79, Cl. D34-4.00R.

Bowden, Tommye C. Beaded figure. 250,904, 1-23-79, Cl. D34-4.00R.

Boyce, Samuel W. H. Combined checkbook holder and lock with keys. 250,915, 1-23-79, Cl. D87-3.00A.

Bruno, John T. Air deflector for vans and similar vehicles. 250,888, 1-23-79, Cl. D12-181.000.

Burkhardt, Ross C.: *See*—
Fagliano, Robert J.; Burkhardt, Ross C.; and Scharmer, Bruce W., 250,873, Cl. D7-194.000.

Burroughs Corporation: *See*—
Clayton, Richard G.; and Sims, Jerry J., 250,889, Cl. D14-44.000.

Carter, Norman R. Globe for a lamp. 250,909, 1-23-79, Cl. D48-16.00C.

Castro, Bernard, to Castro Convertible Corporation. Combined cocktail table, ottoman, removable tray and storage chest unit. 250,860, 1-23-79, Cl. D6-4.000.

Castro Convertible Corporation: *See*—
Castro, Bernard, 250,860, Cl. D6-4.000.

Champion International Corporation: *See*—
Cottrell, Edward D., 250,862, Cl. D6-25.000.

Chicago Pneumatic Tool Company: *See*—
D'Haem, Marcel P., 250,874, Cl. D8-70.000.

Clark, George R.; Meeks, Gary A.; and Sudduth, Dannie D., to Erth-Lite, Inc. Lighting fixture. 250,910, 1-23-79, Cl. D48-23.00R.

Clayton, Richard G.; and Sims, Jerry J., to Burroughs Corporation. Computer system. 250,889, 1-23-79, Cl. D14-44.000.

Colgate-Palmolive Company: *See*—
Sawyer, Ralph V., 250,905, Cl. D34-5.0ST.

Contempo Design Inc.: *See*—
Ornatek, Bridget C., 250,868, Cl. D6-167.000.

Cottrell, Edward D., to Champion International Corporation. Combined stick inserter and display stand for a food product. 250,862, 1-23-79, Cl. D6-25.000.

Cunard, Joel C.: *See*—
Boudreau, Robert J.; and Cunard, Joel C., 250,861, Cl. D6-10.000.

D'Haem, Marcel P., to Chicago Pneumatic Tool Company. Tool retainer for a hand held power tool. 250,874, 1-23-79, Cl. D8-70.000.

E-Z Lift Corporation: *See*—
Fagliano, Robert J.; Burkhardt, Ross C.; and Scharmer, Bruce W., 250,873, Cl. D7-194.000.

Effler, Timothy A., to General Mills Fun Group, Inc. Toy figure. 250,901, 1-23-79, Cl. D34-4.00R.

Eisen, Leonard; and FIG. 1 is a front perspective view of the seat showing my design in the form of a loveseat., to Trend Line Furniture Corporation. Seat. 250,864, 1-23-79, Cl. D6-62.000.

Elevations/Design, Inc.: *See*—
Price, James W., 250,884, Cl. D11-140.000.

Elliott, Clayton A. Adjustable drawer unit or similar article. 250,867, 1-23-79, Cl. D6-159.000.

Erth-Lite, Inc.: *See*—
Clark, George R.; Meeks, Gary A.; and Sudduth, Dannie D., 250,910, Cl. D48-23.00R.

Fagliano, Robert J.; Burkhardt, Ross C.; and Scharmer, Bruce W., to E-Z Lift Corporation. Bin cover. 250,873, 1-23-79, Cl. D7-194.000.

FIG. 1 is a front perspective view of the seat showing my design in the form of a loveseat.: *See*—
Eisen, Leonard; and FIG. 1 is a front perspective view of the seat showing my design in the form of a loveseat., 250,864, Cl. D6-62.000.

Finch, Lloyd J. Bar or similar article. 250,865, 1-23-79, Cl. D6-144.000.

Fletcher, Jerome F.; and Shampang, Wayne H. Marionette. 250,902, 1-23-79, Cl. D34-4.00R.

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Boudreau, Robert J.; and Cunard, Joel C., 250,861, Cl. D6-10.000.

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Lindblom, Lars-Olov H., 250,876, Cl. D8-356.000.
Magis S.R.L.: *See*—
Berti, Enzo, 250,863, Cl. D6-25.000.
Marks, Cedric. Bottle. 250,879, 1-23-79, Cl. D9-72.000.
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McGowen, Inez M. Bottle. 250,878, 1-23-79, Cl. D9-48.000.
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McJunkin, H. P., Jr., 250,911, Cl. D48-24.00B.
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Clark, George R.; Meeks, Gary A.; and Sudduth, Dannie D., 250,910, Cl. D48-23.00R.
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Miavitz, Frederick J. Hanger or the like. 250,877, 1-23-79, Cl. D8-373.000.
Mulligan, John M. Stand. 250,866, 1-23-79, Cl. D6-151.000.
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Newman, Lawrence D. Crucifix. 250,900, 1-23-79, Cl. D99-27.000.
Ornatek, Bridget C., to Contempo Design Inc. Modular display cabinet. 250,868, 1-23-79, Cl. D6-167.000.
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Ozawa, Shuji, to Sunpak Corporation. Stroboflash. 250,894, 1-23-79, Cl. D16-42.000.
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Potts, Robert S. Guide for wires for laboratory apparatus and the like. 250,897, 1-23-79, Cl. D24-29.000.
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Tixier, Michel, 250,912, Cl. D48-32.00R.
Reiner, Lawrence L.; and Hennig, Michael, to Reiner, Lawrence L. Electronic battle game cabinet. 250,906, 1-23-79, Cl. D34-5.00L.
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Ronson Corporation: *See*—
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Taylor, William D., 250,871, Cl. D7-79.000.
Sawyer, Ralph V., to Colgate-Palmolive Company. Game racket. 250,905, 1-23-79, Cl. D34-5.0ST.
Scharmer, Bruce W.: *See*—
Fagliano, Robert J.; Burkhardt, Ross C.; and Scharmer, Bruce W., 250,873, Cl. D7-194.000.
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Sims, Jerry J.: *See*—
Clayton, Richard G.; and Sims, Jerry J., 250,889, Cl. D14-44.000.
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Stone, David S.; and Sokoloff, Maurice A., 250,880, Cl. D9-187.000.
Stahel, Alwin J., to Ball Corporation. Covered storage container. 250,870, 1-23-79, Cl. D7-76.000.
Stanley Home Products, Inc.: *See*—
Artiano, Aldo A., 250,859, Cl. D4-09.000.
Staples, Johnston R., Jr.: *See*—
Huber, Thomas G.; and Staples, Johnston R., Jr., 250,896, Cl. D24-21.000.
Stokes, Rembert R., to Bell Telephone Laboratories, Incorporated. Telephone station set base. 250,890, 1-23-79, Cl. D14-53.000.
Stone, David S.; and Sokoloff, Maurice A. Compartmented food package. 250,880, 1-23-79, Cl. D9-187.000.
Substral International, Pernille S.A.: *See*—
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Clark, George R.; Meeks, Gary A.; and Sudduth, Dannie D., 250,910, Cl. D48-23.00R.
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Ozawa, Shuji, 250,893, Cl. D16-42.000.
Ozawa, Shuji, 250,894, Cl. D16-42.000.
Taylor, William D., to Rubbermaid Incorporated. Canister bin. 250,871, 1-23-79, Cl. D7-79.000.
Thomson-Brandt: *See*—
Meunier, Tiarko, 250,872, Cl. D7-124.000.
Tixier, Michel, to Regie Nationale des Usines Renault. Car front signal light. 250,912, 1-23-79, Cl. D48-32.00R.
Trend Line Furniture Corporation: *See*—
Eisen, Leonard; and FIG. 1 is a front perspective view of the seat showing my design in the form of a loveseat., 250,864, Cl. D6-62.000.
Uniroyal Aktiengesellschaft: *See*—
Poque, Dionysius J., 250,887, Cl. D12-147.000.
Voegler, Hans J., 250,886, Cl. D12-147.000.
Vita-Stat Medical Services, Inc.: *See*—
Huber, Thomas G.; and Staples, Johnston R., Jr., 250,896, Cl. D24-21.000.
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Walker, James E.: *See*—
Procter, Richard M.; and Walker, James E., 250,857, Cl. D2-311.000.
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CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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4,135,526	4,135,537	4,136,370	4,135,563	4,135,677	4,135,889
4,135,581	4,135,539	4,136,371	4,135,678	4,135,746	4,135,900
4,135,606	4,135,551	4,136,394	4,135,730	4,135,749	4,136,345
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4,135,750	4,135,609	4,135,578	4,135,989	4,135,833	4,135,547
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4,135,766	4,135,641	4,136,286	4,136,262	4,135,957	4,136,153
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4,136,062	4,135,697	4,135,393	4,136,393	4,136,001	4,135,533
4,136,309	4,135,711	4,135,426	13 : 4,135,315	4,136,017	4,135,688
4,136,359	4,135,714	4,135,447	4,135,321	4,136,040	4,135,941
9 : 4,135,788	4,135,716	4,135,508	4,135,388	4,136,047	4,135,950
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4,135,471	4,136,293	4,135,286	4,135,632	4,135,634	4,136,334
4,135,493	4,136,308	4,135,364	4,135,639	4,135,684	4,136,349
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54 : 250,911
55 : 250,869

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